

LIQUEFIED NATURAL GAS AND U.S. GEOPOLITICS

OVERSIGHT HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND
MINERAL RESOURCES

OF THE

COMMITTEE ON NATURAL RESOURCES
U.S. HOUSE OF REPRESENTATIVES

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OVERSIGHT HEARING ON LIQUEFIED NATURAL GAS AND U.S. GEOPOLITICS

**Tuesday, February 27, 2018
U.S. House of Representatives
Subcommittee on Energy and Mineral Resources
Committee on Natural Resources
Washington, DC**

The Subcommittee met, pursuant to call, at 2:14 p.m., in room 1324, Longworth House Office Building, Hon. Paul A. Gosar [Chairman of the Subcommittee] presiding.

Present: Representatives Gosar, Lamborn, Tipton, Graves, Hice, Cheney, Bishop (ex officio), Lowenthal, Costa, Beyer, and Soto.

Dr. GOSAR. The Subcommittee on Energy and Mineral Resources will come to order.

The Subcommittee is meeting today to hear testimony on liquefied natural gas and U.S. geopolitics.

Under Committee Rule 4(f), any oral opening statements at the hearing are limited to the Chairman, the Ranking Minority Member, and the Vice Chair. This will allow us to hear from our witnesses sooner and help Members keep to their schedules. Therefore, I ask unanimous consent that all other Members' opening statements be made part of the hearing record if they are submitted to the Subcommittee Clerk by 5:00 p.m. today.

Without objection, so ordered.

STATEMENT OF THE HON. PAUL A. GOSAR, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ARIZONA

Dr. GOSAR. The advent of the Shale Revolution in America has revolutionized the way we extract valuable hydrocarbons, leading to lower energy prices and an infusion into the American economy with billions in revenues. The combination of horizontal drilling and hydraulic fracking technologies has also allowed the United States to transition from a position of energy insecurity to energy dominance.

In recent years, the production of natural gas has allowed the United States to become an undeniable force within the global energy market. Indeed, the United States has become the world's largest producer of natural gas since 2009. And this production must continue if we are to provide our allies with reliable energy, while maintaining jobs and increasing revenues from production here at home.

Further driving our Nation's energy security is the production of liquefied natural gas, or LNG. LNG is produced by shipping natural gas to a liquefaction facility, where the gas is cooled until it is compressed 600 times, becoming liquid. The LNG is then ready to be shipped anywhere in the world.

Global demand for natural gas has tripled in the last two decades, and the advent of new market opportunities indicates that

this trend will no doubt continue and increase America's role in energy security for our allies.

Just last year, the United States became a net exporter of natural gas for the first time since the 1950s. The production, liquefaction, and shipping of LNG has risen to meet the incredible global demand for the product, implicating geopolitics across the globe.

For instance, Russia has long monopolized the gas supply to Europe. According to Deputy Secretary of State John McCarrick, 11 European countries relied on Russian gas to meet 75 percent of their heating and electrical generation needs. The continent is therefore quite exposed to supply disruptions, either intentionally imposed or not.

Russia's Nord Stream pipeline, which supplies westbound gas from Russia to Germany across the Baltic Sea, is approaching its full transmission capacity of 55 billion cubic meters. Germany supports the construction of an identical pipeline, Nord Stream 2, which effectively doubles capacity. If constructed, the highly controversial pipeline will allow Russia to supply 75 percent of Europe's natural gas demand.

In 2017, Cheniere delivered the first shipment of American-produced LNG from its Sabine Pass export terminal in Louisiana to the Baltic nation of Lithuania. Lithuania, like many of its Eastern European neighbors, relied exclusively on Russia to meet its energy demand for decades. This monumental shipment of LNG indicates that the European nations are looking to diversify and to break the stranglehold of Russian energy control.

Outside of Europe, demand for natural gas is skyrocketing in Asia. Last year alone, demand grew 20 percent in China, South Korea, and Japan as these nations continue to grow their economies while limiting greenhouse gas emissions. China is on track to more than double its natural gas from 38.1 million metric tons today to 82 million metric tons by 2030.

Meanwhile, India, which currently operates four LNG import and regasification facilities, is planning to expand its import capacity by 11 terminals.

American companies, such as Cheniere Energy, Incorporated, represented by Mr. Christopher Smith today, have signed some of the largest long-term supply agreements. Just this month, Cheniere signed the first ever long-term LNG supply contract with the Chinese National Petroleum Corporation.

With the rise in demand, Australia has stepped up in the Asian markets, supplying over 80 percent of China's demand for LNG. As such, the United States is now competing for market share with strong local suppliers, and, therefore, it is essential that we support production, LNG export facility permitting, and pipeline capacity here on the American shores.

Today, we will discuss the implications of being a major player in the expanding global energy market.

[The prepared statement of Dr. Gosar follows:]

PREPARED STATEMENT OF THE HON. PAUL A. GOSAR, CHAIRMAN, SUBCOMMITTEE ON
ENERGY AND MINERAL RESOURCES

The advent of the “Shale Revolution” in America has revolutionized the way we extract valuable hydrocarbons—leading to lower energy prices and an infusion in the American economy with billions in revenues. The combination of horizontal drilling and hydraulic fracturing technologies has also allowed the United States to transition from a position of energy insecurity to energy dominance.

In recent years, the production of natural gas has allowed the United States to become an undeniable force within the global energy market. Indeed, the United States has been the world’s largest producer of natural gas since 2009, and this production must continue if we are to provide our allies with reliable energy, while maintaining jobs and increasing revenues from production here at home.

Further driving our Nation’s energy security is the production of Liquefied Natural Gas (LNG). LNG is produced by shipping natural gas to a liquefaction facility, where the gas is cooled until it is compressed 600 times becoming liquid. The LNG is then ready to be shipped anywhere in the world. Global demand for natural gas has tripled in the last two decades, and the advent of new market opportunities indicates that this trend will no doubt continue—and increase America’s role in energy security for our allies.

Just last year, the United States became a net exporter of natural gas for the first time since the 1950s. The production, liquefaction, and shipping of LNG has risen to meet the incredible global demand for the product, implicating geopolitics across the globe.

For instance, Russia has long monopolized gas supply to Europe. According to Deputy Secretary of State John McCarrick, 11 European countries relied on Russian gas to meet 75 percent of their heating and electrical generation needs. The continent is therefore quite exposed to supply disruptions, be they intentionally imposed or not. Russia’s Nord Stream pipeline, which supplies westbound gas from Russia to Germany across the Baltic Sea, is approaching its full transmission capacity of 55 billion cubic meters. Germany supports the construction of an identical pipeline, Nord Stream 2, which effectively doubles capacity. If constructed, the highly controversial pipeline would allow Russia to supply 75 percent of Europe’s natural gas demand. In 2017, Cheniere delivered the first shipment of American produced LNG from its Sabine Pass export terminal in Louisiana to the Baltic nation of Lithuania. Lithuania, like many of its Eastern European neighbors, relied exclusively on Russia to meet its energy demands for decades. This monumental shipment of LNG indicates that European nations are looking to diversify and break the stranglehold of Russian energy control.

Outside of Europe, demand for natural gas is skyrocketing in Asia. Last year alone, demand grew 20 percent in China, South Korea, and Japan, as these nations continue to grow their economies while limiting greenhouse gas emissions. China is on track to more than double its natural gas from 38.1 million metric tons today to 82 million metric tons by 2030. Meanwhile, India, which currently operates four LNG import and regasification facilities, is planning to expand its import capacity by 11 terminals. American companies, such as Cheniere Energy, Inc., represented by Mr. Christopher Smith today, have signed some of the largest long-term supply agreements. Just this month, Cheniere signed the first ever long-term LNG supply contract with the Chinese National Petroleum Corporation.

With the rise in demand, Australia has stepped up in the Asian markets, supplying over 80 percent of China’s demand for LNG. As such, the United States is now competing for market share with strong local suppliers, and therefore, it is essential that we support production, LNG export facility permitting, and pipeline capacity here on American shores. Today, we will discuss the implications of being a major player in an expanding global energy market.

Dr. GOSAR. I now recognize the Ranking Member.

Do you have a statement?

Mr. BEYER. Mr. Chair, I would yield to the actual Ranking Member when he comes later, if that is possible. If not, we will put it in the record.

Dr. GOSAR. That sounds good. We are going to go right to our witnesses then.

First, we have Mr. Christopher Smith, Senior Vice President of Policy, Government, and Public Affairs, Cheniere Energy, Incorporated; Mr. Peter Doran, President and CEO of the Center for European Policy Analysis; Mr. David Livingston, Deputy Director for Climate and Advanced Energy at the Atlantic Council; and Ms. Meg Gentle, President and CEO of Tellurian, Incorporated.

Let me remind the witnesses that, under our Committee Rules, they must limit their oral statements to 5 minutes, but their entire statement will appear in the record as detailed.

Our microphones are not automatic. For the first 4 minutes, you will see the green. Then it will turn to yellow for 1 minute. When you see it red, summarize and get done.

I will now recognize Mr. Smith for your 5 minutes.

STATEMENT OF CHRISTOPHER SMITH, SENIOR VICE PRESIDENT, POLICY, GOVERNMENT, AND PUBLIC AFFAIRS, CHENIERE ENERGY, INC., HOUSTON, TEXAS

Mr. SMITH. Thank you very much. Chairman Gosar, Ranking Member Lowenthal, and members of the Subcommittee, it is an honor to appear before you on behalf of Cheniere Energy, Incorporated. I would also like to recognize Representative Graves and Gohmert from Louisiana and Texas, where Cheniere lives and works.

Cheniere Energy is a Houston-based energy company that provides clean, secure, and affordable U.S. natural gas to the world. Over 280 cargos of U.S. LNG from Sabine Pass have been delivered to 25 countries and regions since start-up in February of 2016.

Cheniere is a full-service liquefied natural gas company, which makes us unique in the U.S. LNG industry. We procure North American natural gas, transport that gas through our own pipelines or existing pipeline networks, build and operate large-scale liquefaction facilities, and offer U.S. LNG to our customers either at our facility or delivered to import facilities around the world.

Cheniere's operations create jobs at home and project American influence abroad. Cheniere is the first company to export LNG from the contiguous United States and is the largest U.S. LNG exporting company. Cheniere is investing approximately \$30 billion in American energy infrastructure and has created thousands of direct jobs and tens of thousands of indirect jobs across America.

When all our production capacity that is currently under construction is on line in 2020, we will be a top-five global LNG supplier.

Cheniere's investment is having a positive impact on global energy markets, providing affordable and reliable natural gas to countries around the world to meet their energy needs. U.S. natural gas is an attractive alternative for many customers, particularly those who are captive to a handful of suppliers, making them vulnerable to supply disruptions and, at times, geopolitical dynamics.

Due to the commercial nature of our domestic energy industry, U.S. natural gas did not come with a political requirement or pressures, helping to depoliticize the commodity. As a result, it is

making natural gas a more economic and more secure fuel for buyers around the world.

Many countries—developed and developing, traditional LNG importers and emerging markets—are also choosing natural gas as part of a global shift toward a lower-carbon energy mix that favors natural gas over coal and liquid fuels, reducing air pollution and carbon emissions. Just as the Shale Revolution has allowed the United States to reduce carbon emissions, the export of liquefied natural gas makes similar advances possible worldwide.

Cheniere is the largest physical consumer of natural gas in the United States, sourcing gas from Texas, Louisiana, Arkansas, Pennsylvania, Ohio, West Virginia, Oklahoma, Illinois, and Kentucky.

We have a role in promoting environmental standards that will maintain the sustainability of the LNG that we sell. We are committed to working with our suppliers to maintain high and consistent environmental standards, including working to reduce methane leakage.

Cheniere and the U.S. LNG industry are well-positioned to compete in the increasingly competitive global natural gas market. Indeed, earlier this month, we executed two long-term agreements with the China National Petroleum Corporation. Our success in China to date is due to our ability to execute, and a value proposition that will be difficult for others to match.

These are the first direct, long-term LNG supply contracts between a Chinese company and a U.S. LNG exporter, a historic milestone in energy cooperation between the United States and China and a constructive way to address trade imbalances. We expect these agreements to support our growth plans and are focused on the remaining steps necessary to achieve a final investment decision at Train 3 at Corpus Christi in the next several months. This will be the first new large-scale LNG capacity to progress to construction in the United States since 2015.

And we are just getting started. Cheniere plans to lead the next wave of American LNG by continuing to make investments in American jobs and infrastructure. It is important to note that Cheniere's existing LNG platform, over \$30 billion, has followed a transparent public regulatory process both by the Department of Energy and the FERC, where it has considered both environmental and economic issues.

And while we always like to see these processes move along faster, our business model does not benefit from cutting corners. It is important that these processes are robust enough to withstand public scrutiny. If we want to continue to project American influence abroad through U.S. LNG exports, we need to ensure regulatory certainty for domestic infrastructure and that domestic production is safe and environmentally sustainable.

The future growth of U.S. LNG exports will be determined by whether projects are able to provide the most attractive commercial terms in a fiercely competitive global LNG market. In that, Cheniere plans to continue leading the U.S. LNG export industry.

Thank you, and I look forward to answering your questions during the question session.

[The prepared statement of Mr. Smith follows:]

PREPARED STATEMENT OF CHRISTOPHER SMITH, SENIOR VICE PRESIDENT,
CHENIERE ENERGY, INC.

Chairman Gosar, Ranking Member Lowenthal, and members of the Subcommittee, it is an honor to appear before you on behalf of Cheniere Energy, Inc. We appreciate the opportunity to discuss the global economic, energy security, and environmental benefits of exporting U.S. natural gas. I'd also like to recognize Representatives Graves and Gohmert from Louisiana and Texas, where we live and work.

Cheniere Energy is a Houston-based energy company that provides clean, secure, and affordable U.S. natural gas to the world. Cheniere is a full-service liquefied natural gas ("LNG") company, which makes us unique in the U.S. LNG industry: we procure natural gas from the robust North American natural gas market, construct and operate pipelines and contract capacity on multiple existing pipelines to transport that gas to our facilities, build and operate large-scale liquefaction facilities, and offer U.S. LNG to our customers either at our facility or delivered to import facilities around the world. Cheniere owns and operates the Sabine Pass LNG Terminal in Cameron Parish, Louisiana and is constructing additional liquefaction and export facilities at the Sabine Pass LNG Terminal and near Corpus Christi, Texas. Cheniere has a global presence with offices in Houston, Washington, London, Santiago, Singapore, Tokyo, and Beijing.

Cheniere's operations create jobs at home, and project American influence abroad. Cheniere is the first company to commercially export LNG from the contiguous United States. Cheniere is constructing or operating around half of the approximately 10 Bcf per day of LNG export capacity under construction in the United States, making Cheniere the largest U.S. LNG exporting company.

Cheniere expects to make an approximately \$30 billion investment in American energy infrastructure. Cheniere has directly created thousands of jobs and, from local services to increased domestic energy production, tens of thousands of indirect jobs across America. Cheniere, with our engineering, procurement and construction ("EPC") contractor Bechtel, sources materials for our facilities from nearly 1,600 different manufacturers across 46 states. Supporting U.S. energy exports and free trade supports U.S. jobs and American manufacturing.

Cheniere's investment is having an impact on global energy markets. When all of our production capacity currently under construction is on line, which is expected to be by 2020, we are projected to be a top-5 global LNG supplier alongside longtime industry participants such as Shell and Qatar Petroleum.

Cheniere Energy is uniquely committed to U.S. success on both energy production and environmental stewardship, as it is that combination that supports the long-term growth of U.S. natural gas exports. An important part of our business model is the fact that we're selling an affordable, reliable, cleaner fuel that customers around the world want. Cheniere sells into a global market, and every Cheniere customer resides in a country that has committed to reducing emissions under the Paris Agreement. LNG is contributing to a global shift toward a lower-carbon energy mix that favors natural gas over coal and liquid fuels—reducing air pollution and carbon emissions. Many countries—developed and developing, traditional LNG importers and emerging markets—are choosing natural gas as a lower-carbon, affordable and reliable option for their energy portfolio.

Cheniere is already the largest physical consumer of natural gas in the United States. We are currently consuming approximately 3.2 Bcf/d of gas per day, and once our seven trains that are either operating or are under construction are in operation, we will be consuming approximately 5–6 percent of total U.S. gas production at a level just under 6 Bcf/d. This gas consumption, which supplies our export facilities, is responsible for many jobs associated with the upstream domestic production and transportation of natural gas across the country. Cheniere sources gas produced across the country, including Texas, Louisiana, Arkansas, Pennsylvania, Ohio, West Virginia, Oklahoma, Illinois, and Kentucky. We have also purchased gas produced in the Montney basin in Canada.

Our market position domestically and internationally provides us with a unique responsibility to promote standards that support the value of the LNG that we sell. Methane leakage rates are a critical variable in the Greenhouse Gas lifecycle of LNG. We are committed to working with our suppliers to maintain high and consistent environmental standards, including working to reduce methane leakage as well as promoting water conservation and recycling.

Since the start-up of operations in February 2016, over 280 cargoes of U.S. LNG from Sabine Pass have been delivered to 25 countries and regions. In 2017, cargoes from Sabine Pass were landed all over the world, with Mexico, South Korea and China as the top three destinations. This is in line with recent trends in the global

market, reflecting Asia as the most dominant source of LNG demand growth. About 45 percent of the cargoes from Sabine Pass were delivered to Asian markets, 30 percent to Latin America, 15 percent to Europe, and about 10 percent to Middle East and North Africa. The worldwide distribution of destinations from the Sabine Pass LNG Terminal is a result of Cheniere's business model and destination free contracts.

Cheniere's liquefaction facilities currently under construction or in operation across our two facilities are underpinned by long-term contracts with 13 third party customers which represent approximately 80 percent of their expected aggregate LNG production capacity. Our long-term foundation customers—a mix of International Oil Companies ("IOC"), National Oil Companies ("NOC"), Trading Houses and end-users (such as utilities)—purchase LNG at our facilities at a price linked to Henry Hub, and can pick it up to deliver to their end market or almost anywhere in the world. To date, Cheniere has initiated our long-term contracts with Shell/BG of the UK and Holland, Gas Natural Fenosa of Spain, and Korea Gas Corporation ("KOGAS") according to their date of first commercial delivery ("DFCD") under their contracts, and will shortly begin long-term supply to GAIL Limited of India in March. Cheniere's long-term foundation customers determine the final destination of U.S. LNG in accordance with U.S. law and regulation, and the multitude of destinations for U.S. LNG highlights its importance to the development of an open, transparent and free market for global LNG. Cheniere also manages a portfolio of our liquefaction capacity, chartering a fleet—currently over 20—of LNG carriers to deliver LNG directly to our customers at import facilities around the world, directing cargoes based on market prices.

The same exports that grow our economy strengthen the global energy market, providing affordable and reliable natural gas to countries around the world to meet their energy needs. U.S. natural gas is an attractive alternative for many consumers, particularly those who are captive to a handful of suppliers, making them vulnerable to supply disruptions and, at times, geopolitical dynamics. Due to the commercial nature of the domestic energy industry, U.S. natural gas does not come with political requirements or pressures, helping to depoliticize the commodity. U.S. natural gas priced at a linkage to Henry Hub in the Gulf Coast—the most transparent and liquid gas price index in the world—provides price and supply source diversity to customers, who have traditionally purchased LNG based on a price linked to oil, helping strengthen competition in natural gas markets and the global energy market. U.S. LNG is making the global natural gas trade more competitive, more responsive to customer needs and more resilient. As a result it is making natural gas a more economic and more secure fuel for buyers around the world.

Cheniere and the U.S. LNG industry are well-positioned to compete in the increasingly competitive global natural gas market. Destination flexible contracts, affordable prices linked to Henry Hub, and diversified supply from the robust U.S. natural gas market are key factors that will drive the expansion of U.S. export capacity. Cheniere's on time and on budget engineering and construction record, growing reputation as a reliable operator and ability to leverage first mover advantages leading to the most attractive commercial terms are key differentiators that will help us continue to lead the U.S. LNG industry.

Indeed, Cheniere recently announced three new long-term Sales and Purchase Agreements ("SPA"). In January we executed a long-term SPA with Trafigura, and earlier this month we executed two long-term SPAs with a subsidiary of China National Petroleum Corporation. These CNPC transactions in particular demonstrate Cheniere's strategic positioning, our ability to execute, and a value proposition that is difficult for many to match. We are honored to be involved in this historic deal—the first direct, long-term LNG supply contract between a Chinese company and a U.S. LNG exporter—a significant milestone in energy cooperation between the United States and China. We expect these long-term SPAs to support our growth plans and we are focused on the remaining steps necessary to make a final investment decision Train 3 at Corpus Christi in the next several months, which would be the first new large-scale LNG capacity to progress to construction in the United States since 2015.

The United States is still adjusting from an age of scarcity to an age of abundance with respect to energy, and U.S. LNG is showing the benefits of that abundance. The export of natural gas from the United States as LNG is driving beneficial changes in the global natural gas trade—changes that help make the fuel mix of many existing trade partners more sustainable, more economic and more secure. It also has and is expected to open new trade routes and relationships—extending the sphere of U.S. trade influence. To support U.S. LNG exports and domestic energy production, it is important for the United States to continue to advocate free and open markets, the rule of law and contract sanctity, and the importance of low-

carbon energy sources. This will help ensure the continued growth of U.S. natural gas exports, creating jobs and economic benefits to the United States.

QUESTIONS SUBMITTED FOR THE RECORD BY REP. HICE TO CHRISTOPHER SMITH, SVP,
CHENIERE ENERGY

Question 1. As our export capacity grows, we will increasingly be able to compete with Russian companies—such as Gazprom—to supply Europe with energy sources. Do you feel that our ability to export LNG to the continent reduces Russian leverage in Europe and could improve the national security of our European allies?

Answer. U.S. natural gas is an attractive alternative for many consumers, particularly those who are captive to a handful of suppliers, making them vulnerable to supply disruptions and, at times, geopolitical dynamics. Due to the commercial nature of the domestic energy industry, U.S. natural gas does not come with political requirements or pressures, helping to depoliticize the commodity.

In addition, Europe, like many places around the world, is looking for supply diversity, with the understanding that it is a competitive price environment. Diversifying energy supplies is one of the primary means for ensuring energy security. The flexibility conferred by the nature of Cheniere's contracts, global presence, and chartered fleet of LNG carriers ensure that we have the capacity to supply U.S. natural gas to markets looking to diversify their supplies.

Dr. GOSAR. Thank you, Mr. Smith.

We are going to go a little out of sequence, go down the row and then back to the Ranking Member.

So, Mr. Doran, you are now recognized for 5 minutes.

**STATEMENT OF PETER B. DORAN, PRESIDENT AND CEO,
CENTER FOR EUROPEAN POLICY ANALYSIS, WASHINGTON, DC**

Mr. DORAN. Good afternoon, Mr. Chairman, Ranking Member, and members of the Committee. I am Peter B. Doran, President and CEO of CEPA, the Center for European Policy Analysis. I want to thank you for the opportunity to speak with you today. It is an honor to give this testimony.

I would like to submit my written testimony for the record and offer a few brief thoughts on my summary of liquid natural gas and U.S. geopolitics.

Mr. Chairman, my organization is a U.S.-based non-profit policy institute dedicated to the study of Central Europe. At CEPA, we have developed an ongoing effort to inject new insight, analysis, and ideas into the current considerations over the role of LNG exports and to support America's allies and partners overseas.

Our goal is to make sure that the world has a chance for safe, secure, rules-based energy relationships. This is especially important in countries like central Europe. The timing and scope of this hearing could not be more relevant.

When we look at the question of LNG and geopolitics, we invariably uncover the persistent question of competition from Russia. Russia's advocates like to say that Kremlin gas is cheaper than American LNG. Based on our research and reporting at CEPA, my main message to the Committee is this—there is no such thing as cheap Russian gas. More than the cost of a BTU, energy relations with Russia impose high political and geopolitical costs on countries, customers, and the idea of fair play in a marketplace.

When we survey the horizon, we can be sure that increased demand for American LNG is good for domestic production, good for our economy, and great for customers who need it. The problem is that LNG exporters like the United States face stiff competition in Europe from monopolistic suppliers like Russia. The Russian government derives immense benefits from placing its hidden costs on its consumers, most especially when these hidden costs allow the Kremlin to use energy as a weapon or, most recently, as a wedge issue between America and Europe.

More than any other commodity, energy relations bind countries together. Russian leaders understand this dynamic. They want America's allies to be dependent on Russia's state-owned companies to fuel their economies and keep their citizens warm in winter.

If ever there was a time for robust American leadership in Europe and to increase our own ties that bind us closer to allies in partner countries, this is it.

The problem is that, right now, Russia is ahead of us. I am speaking, of course, of Russia's Nord Stream pipeline to Germany. A sizable addition to this pipeline, Nord Stream 2, is proposed, and if it is ever completed, the unwanted costs that Russia imposes on its European customers, our allies, will be substantial.

This Committee should have no doubt, Russia's Nord Stream 2 pipeline is not a straightforward commercial venture to link Germany to Russian gas fields. Instead, Nord Stream 2 has larger strategic purposes: to undercut the EU's energy supply security, to close large parts of Europe to gas-on-gas competition, and to isolate and damage America's strategic partner Ukraine. We should take this challenge very seriously.

Mr. Chairman, I would suggest to the Committee that the solution to this geopolitical challenge has three parts, and America plays an essential role in each. First, American and other LNG exporters are helping to protect vulnerable consumers against monopolistic business practices by the Kremlin. Second, energy connectivity is happening, linking our upstream in America with downstream consumers. This is a process, and the job is not yet done.

A third part of this solution is in the policy realm. Give Congress a round of applause for the work it has done in actually providing the Administration the tools that it needs to help support the allies we have in Europe. I would especially note the provisions in existing legislation to encourage the State Department to work closely with Ukraine. Ukraine could suffer tremendously if Nord Stream 2 is constructed.

Looking ahead, my final message to the Committee is this: the contest over the future of Nord Stream 2 is likely to intensify in 2018, and its consequences could reverberate for years to come. I have included a menu of recommendations for the Committee to consider in my written testimony, and I am happy to take questions from Members.

But I would highlight this message to you: U.S. leadership is crucial in helping to protect our allies and partner countries from monopolistic business practices by the Kremlin. Its geopolitical interests are at odds with ours. Let's not let Vladimir Putin win. Let's disappoint him.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Doran follows:]

PREPARED STATEMENT OF PETER B. DORAN, PRESIDENT AND CEO, CENTER FOR
EUROPEAN POLICY ANALYSIS

Good afternoon, Mr. Chairman, Ranking Member, and members of the Committee. I am Peter B. Doran, President and CEO at the Center for European Policy Analysis (CEPA). I want to thank you for inviting me here today. It is an honor and a privilege to give this testimony. I would like to submit my written testimony for the record and offer a summary of my thoughts on “Liquefied Natural Gas and U.S. Geopolitics.”

Mr. Chairman, my organization is a U.S.-based non-profit policy institute dedicated to the study of Central Europe. At CEPA, we have developed an ongoing effort to inject new insight, analysis, and ideas into current considerations over the role U.S. energy exports (such as LNG), and to support the efforts of America’s allies and partner countries to establish an energy future that is safe, secure and based on the rules of the market. The timing and scope of this hearing could not be more relevant.

Based on our research and reporting at CEPA, my main message to the Committee is this:

There is no such thing as “cheap” Russian gas. More than the cost of a Btu (British thermal unit), energy relations with Russia impose high political and geopolitical costs on countries, customers, and the idea of fair play in a marketplace. The Russian government derives immense benefit from placing these hidden costs on its customers, most especially when they allow the Kremlin to use energy as a weapon—or most recently—as a wedge issue between America and Europe.

More than practically any other commodity, energy relations bind countries together. Russian leaders understand this dynamic. They want America’s allies to be dependent on Russia’s state-owned energy companies to fuel their economies and keep their citizens warm in winter. In order to do so, Russia seeks to limit—where possible—outside energy competition in Europe. This is Russia’s aim—and we should not let the Kremlin win.

If ever there was a time for robust American leadership in Europe—and to increase our own ties that bind us closer to allies and partner countries—this is it. The problem is that, for now, Russia is ahead of us.

For the first time since the 2008 Russia-Ukraine Gas Crisis, America’s allies in Europe face a return to the dangers of widespread, long-term energy dependence on Russia. During the previous crisis in 2008, the Russian government demonstrated its ‘winner-take-all’ approach to energy deals when it abruptly halted winter natural gas shipments to tens of millions of consumers extending from the Ukrainian border all the way to the Eastern Balkans. The Kremlin had turned energy into a political weapon.

What followed in the wake of this crisis was a groundbreaking response from the EU to construct a new network of regulatory and legal fortifications against monopolistic energy suppliers. This effort was historic in nature and broad in scope, and in many ways important. Only, these steps were just a set-back for monopolistic energy suppliers—not a knock-out. In Russia’s case, the Kremlin’s state-owned energy sector has now offered a response: the Nord Stream 2 (NS2) pipeline.

This Committee should have no doubt: Russia’s NS2 project is not a straightforward commercial venture to link Germany with Russian gas fields.

Instead, NS2 has a larger strategic purpose: to undercut the EU’s energy supply security, to close large parts of Europe to gas-on-gas competition, and to isolate and damage America’s strategic partner: Ukraine. These outcomes present a mid- to long-term danger to American interests, yes. But they are a far more existential challenge to the immediate national interests of our allies and partner countries in Europe. We should take this challenge very seriously.

Mr. Chairman, I would suggest to the Committee that the solution to this geopolitical challenge has three parts—and America plays an essential role in each.

First, we should view America’s capacity to export LNG to the world as more than just an economic boon at home. This capacity offers profound strategic benefits to America. As members of the Committee are aware, over the last two decades the North American shale revolution has positioned the United States to bring ever-increasing levels of LNG (and crude oil) onto the global energy market. It is exceptionally beneficial to our allies and partner countries in Asia, Europe and elsewhere. In some cases, our energy shipments are helping to diversify allies away from sole-source dependence on Russia. This has been a long-standing aim of U.S. foreign

policy. And we are only now beginning to achieve it. Together with supplies from the Middle East and other regions, Americans can take pride in the fact that we are helping to protect vulnerable consumers beyond our shores; and to increase their leverage in energy negotiations with Moscow. These are great outcomes.

Second, energy interconnectivity is happening. There was a time when individual markets in Europe were cut off from America, isolated from their neighbors, and largely dependent on a single pipe(s) from Russia. That's changing. Today we are seeing how new infrastructure is beginning to redraw the energy map of Europe. This change is beginning to give consumers *options*. On the U.S. side, facilities like the Sabine Pass LNG terminal (and others) give our companies the ability to reach new export markets abroad. Meanwhile in the Central-East European (CEE) region—a region that previously enjoyed few alternatives to Russia—we have seen the construction of coastal LNG terminals in Swinoujskie (Poland) and Klaipeda (Lithuania); as well as the realization of necessary interconnectors across borders. The overall result is positive. These interconnectors represent a major step toward achieving the goal of encouraging market forces to match supply with demand in the CEE natural gas sector, but the job is far from done. Interconnectivity is a crucial precondition. The main question of getting non-Russian gas to vulnerable consumers is still unresolved for some land-locked countries. Major infrastructure development is still an unfinished business.

A third part of the solution exists in the policy realm. Congress should be commended for doing its part. I would highlight for the Committee the importance of the “Countering Russian Influence in Europe and Eurasia Act of 2017,” and applaud the provisions directing the Department of State to work with the government of Ukraine to increase that country’s energy security. The Administration deserves equal recognition. When Sec. Rex Tillerson declared America’s opposition to NS2 in Warsaw last month, his statement was welcomed by many allies from the Baltic to the Black Seas. For years, Europeans asked America to lead from the front. Now we are—and we are not alone. We have allies in Europe who support us. Sec. Tillerson was correct when he stressed in Warsaw how America’s opposition to NS2 was based on our mutual strategic interests with Europe. NS2 is a threat to everyone. And thanks to Congress, the executive branch has an arsenal of new tools to counter the spread of the Kremlin’s malign influence in the energy space. If deployed carefully, judiciously, and in the right sequence then the Administration’s expanded armory of policy tools—including sanctions—may have a beneficial effect in halting the spread of Russia’s malign influence across Europe. It is a robust toolkit that, as a citizen, I would like to see fully employed in support of our allies and partner countries.

Now, if this assessment seems positive—and indeed there is a lot of good news here—I would add a note of caution for the Committee: be wary of the next phase in the fight over NS2.

This is my second message to the Committee: **The contest over the future of NS2 is likely to intensify in 2018; and its consequences could reverberate for many years to come.**

As stated earlier, the NS2 pipeline is not a purely commercial venture. This project serves the Kremlin’s geopolitical aims. These are in direct conflict with our own.

Ultimately, NS2 is intended to shut down gas-on-gas competition in Europe—and to isolate America’s strategic partner: Ukraine. NS2 is a direct challenge to America’s win-win approach to our relations with European allies. By contrast, Russia sees its interests in NS2 in terms of win-lose—and the Kremlin wants us to lose. Let’s disappoint Vladimir Putin.

In the commercial realm, we want Europe to enjoy the benefits of gas-on-gas competition, where supply and demand determine prices—not international politics. As a threat to gas-on-gas competition, Russia’s NS2 will be bad for European consumers. Moreover, the pipeline will make entire countries and regions inside the EU more vulnerable to the use of energy as a weapon. In the past, Russia has repeatedly used energy as a weapon against its neighbors. There is good reason to believe that it could do so in the future. It is why the establishment of enduring, market-based alternatives to Russia are firmly in line with U.S. national interests; and the interests of everyday Europeans.

A second area where our energy interests conflict with Russia is over the future of Ukraine. Here too, Russia’s NS2 pipeline serves a geopolitical purpose—one that runs counter to our own. By completing NS2, Russia will be able to deny Ukraine between \$2–3 billion a year in gas transit revenue. Moscow seeks to isolate Ukraine in the energy space and pressure it financially. The Russian government does not

want Ukraine's Western-orientated policies and reforms to succeed. Once again, we want the opposite.

Ukrainians have already showed the world that they seek a Western future for their country. The United States wants Ukraine's success to be a resounding refutation of Vladimir Putin's authoritarian model. And unlike Putin, America has a very clear and compelling interest to see that Ukraine succeeds.

If Russia's NS2 gambit is ever going to be completed, then its owners will need to pull off a series of financial, regulatory, and legal victories. In terms of finance, it appears that the pipeline's backers will not be able to bear the full cost of NS2 out of Russia's coffers. The pipeline will therefore need outside lenders to assist with financing. On the regulatory front, NS2 must receive a series of approvals at the national and European levels in order to proceed. A final 'green light' from Germany—for example—would almost certainly pit Berlin against other European capitals who feel they would be negatively impacted by NS2. Diplomatic cooperation and multilateral communication between the United States and European allies will be essential on this front, particularly if disagreement over the pipeline between EU Member States sets up a third battle in the EU court system. Even if Russia loses its NS2 gambit in the political or legal realm, it will gain by creating ruptures between its presumed competitors in the West. This makes energy deliberations in Europe a national security priority for the United States.

Mr. Chairman, these questions are front and center for my organization, CEPA, and like you, we will be watching such developments closely.

Looking ahead into 2018, the potential challenges may seem great—but so are the opportunities. We should never doubt that America's new energy abundance grants us a tremendous economic benefit at home and a strategic advantage abroad. When we consider risks on the horizon, Europe should be at the forefront of our attention. If members of this Committee, leaders in the Administration, the private sector, and the expert community are going to defeat Russia's attack on long-term energy security in Europe (via NS2), then allies on both sides of the Atlantic will need to apply the right combination of commercial, diplomatic, and legal mechanisms to stop NS2. The stakes for Europe are tremendously high—and the clock is ticking.

For the recommendations that follow, CEPA has developed a package of ideas to address different dimensions of the energy and geopolitical problem—set in Europe—and how America might play a beneficial role.

I present them to the Committee for consideration.

Recommendations

When it comes to NS2, European law is on our side—let's encourage Member States to use it. Congress and the Administration should encourage EU Member States to mobilize their clear and vocal support in Brussels for the full and uniform implementation of the EU's 2009 Gas Directive. They should make it abundantly clear: EU law applies to everyone uniformly—Russia does not get its own special exemptions. Full and uniform implementation of the 2009 Gas Directive could halt NS2 in its tracks.

Leverage our soft power to the hilt. The Administration can ramp up its diplomatic engagement in countries like Croatia, where Russia wants to prevent a new LNG facility from being constructed on Krk Island. Croatia needs to know: it does not stand alone, but with the United States. Its LNG project serves a strategic purpose in Europe. When completed, Krk Island would open up non-Russian gas alternatives to consumers across Southeast and Central Europe.

Make energy security part of Ukraine's success story. Fair competition and market liberalization are just as important for Ukraine's energy sector as they are for the EU. Ukraine stands to gain as much—and more—from a diversification of its energy imports. Finding ways to prioritize U.S. exports of energy to Ukraine will benefit our own economy and strengthen our foreign policy position east of NATO.

Energy is a front in Russia's information war against the West—let's defend that front. CEPA research has shown how outlets of Russian propaganda are conducting a comprehensive disinformation campaign to manipulate the energy vulnerabilities of allies like the Baltic states. Its narratives are calibrated to divide U.S. allies against each other, while spreading the false impression that the EU does not support energy independence from Russia in the Baltics. When crafting America's all-of-government approach to counter-propaganda, addressing energy disinfo should be a priority.

Dr. GOSAR. Thank you, Mr. Doran.

Mr. Livingston, you are now up for 5 minutes.

**STATEMENT OF DAVID LIVINGSTON, DEPUTY DIRECTOR FOR
CLIMATE AND ADVANCED ENERGY, ATLANTIC COUNCIL,
WASHINGTON, DC**

Mr. LIVINGSTON. Chairman Gosar, Ranking Member Lowenthal, and distinguished members of the Subcommittee, thank you for the opportunity to appear before you and to present additional perspectives on the matters being discussed today.

My name is David Livingston, and I serve as Deputy Director for Climate and Advanced Energy in the Global Energy Center of the Atlantic Council. The Atlantic Council is a non-partisan, non-profit organization headquartered in Washington, DC.

My remarks and written testimony were prepared in accordance with the Atlantic Council policy on intellectual independence. These remarks are my own, and the Atlantic Council and its donors do not determine, nor do they necessarily endorse or advocate for, any of my views.

Given that the topic of LNG's role in U.S. geopolitics has been well-covered and will continue to be well-covered by the other witnesses, I plan to address the role of climate leadership and advanced energy technologies in further advancing global gas markets and U.S. national security.

To begin with, the United States should embrace rather than retreat from the broader trend shaping the global energy market in an increasingly climate-conscious world. A number of countries, including China, specifically identify natural gas as a greenhouse gas emissions reduction strategy to meet their Paris climate commitments. And many others, from Latin America to Southeast Asia, clearly have a compelling need for LNG to meet their decarbonization goals.

When the unambiguous clean air benefits of natural gas over coal are taken into account, its appeal for countries grappling with harmful smog and air pollution is all the more clear.

How might the United States, then, best capitalize on these opportunities? I would suggest that the United States should embrace an international climate change framework that is flexible, fair, and that grows markets for gas, renewables, and other advanced energy technologies in which the United States has natural advantages.

This framework exists. It is the Paris Agreement, formalized in 2015 but many years in the making by American diplomats.

Indeed, I would note the recent words of George David Banks, a climate and energy adviser who served in both the George W. Bush and, more recently, the Trump administration, "The Paris agreement is a good Republican agreement. It's everything the Bush administration wanted. . . . It's a climate policy based on U.S. national interest that the Bush team started and the Obama team kept. . . . The climate agenda is not going to go away anytime soon, and if you're not engaged aggressively, actively, there are going to be policies that are detrimental to the United States."

I agree with this assessment and will briefly outline a few ways in which the lack of U.S. climate leadership might be detrimental to U.S. economic and national security interests.

Given that if it were to leave the Paris Agreement the United States would be the only country in the world outside of it, this would leave significant scope for future evolutions of the international climate governance architecture, over which the United States would have no say but by which it would inevitably be impacted.

In the 1960s, the United States accounted for 40 percent of global GDP. Today, it accounts for just over 20 percent. In other words, the United States, as an isolated climate policy island, is not insulated from the rising tide of agreements and economic architectures forged by the rest of the world.

For example, some foreign officials and politicians have floated the idea of tariffs or even sanctions being applied to the United States should it unilaterally withdraw from the Paris Agreement.

With the opening of China's national carbon market this year, a growing share of the global economy is under a formal carbon price, increasing the dangers of tariffs or other measures being levied against jurisdictions without formal carbon pricing.

The most punitive of these prospects would likely never occur. Others are distant but plausible. But some are already evident. The European Union is now refusing to complete a new trade agreement with any partner that has not only joined but also officially ratified the Paris Agreement. To take another angle, imagine if countries were to halt LNG imports from countries that have not ratified the Paris Agreement, just as today the United States provides preferential LNG export approval to countries which have a free trade agreement with the United States.

Equally, if not more, critical to the long-term geopolitical interests of the United States is that this country does not abandon its superlative strengths in innovation and advanced energy technologies. Global renewables deployment has gone from less than \$20 billion per year a decade ago to now enjoying the eighth consecutive year in which investment has been between \$250 billion and \$350 billion.

But, today, as the United States mulls dramatic budget cuts to its leading energy innovation programs, other actors such as China are stepping in to fill the gap. China recognizes not only the domestic benefits of advanced energy, from clean air to reduced energy imports, but also the geopolitical opportunities. In emerging sectors, such as batteries and electric vehicles, it seeks to shape markets early on, setting key standards, locking in certain technology pathways, and locking out innovations from smaller countries with its economies of scale.

In conclusion, the opportunities afforded by growing LNG exports, while plentiful, should not distract from other critical priorities, including shaping global climate action and ensuring that innovation drives America's energy edge well into the future.

Thank you for the opportunity to provide my thoughts on U.S. energy and geopolitics, and I look forward to taking your questions.

[The prepared statement of Mr. Livingston follows:]

PREPARED STATEMENT OF DAVID LIVINGSTON, DEPUTY DIRECTOR FOR CLIMATE &
ADVANCED ENERGY, ATLANTIC COUNCIL

Chairman Gosar, Ranking Member Lowenthal, and distinguished members of the Subcommittee, thank you for the opportunity to appear before you and to present additional perspectives on the matters being discussed today.

My name is David Livingston and I serve as deputy director for climate and advanced energy in the Global Energy Center of the Atlantic Council. The Atlantic Council is a non-partisan, non-profit organization headquartered in Washington, DC. My remarks and written testimony represent my views, and do not necessarily represent the views of my colleagues or institution.

LIQUEFIED NATURAL GAS AND U.S. GEOPOLITICS

U.S. natural gas production has been booming for nearly a decade, while recently U.S. liquefied natural gas (LNG) exports have been increasing, as well. There are a number of benefits that accrue to the United States from exports of liquefied natural gas and the expansion of domestic natural gas production needed to support them. Increased LNG exports can help to narrow the U.S. current account deficit, expand economic activity and employment in the natural gas extraction, processing, and related industries, and aid broader American foreign policy goals insofar as they contribute to a diverse, sustainable, and affordable energy mix in recipient markets. As such, increased LNG exports would indeed appear to strengthen the U.S. position in global geopolitics.

Three commonly raised caveats to the aforementioned view are that (1) U.S. economic and energy security interests may be better-served by keeping most, or all, of this gas at home as inputs into domestic activities, (2) local environmental risks could rise alongside increasing U.S. production needed to feed exports, particularly U.S. shale production, and (3) natural gas may not offer climate benefits, either due to high rates of methane leakage associated with its production and processing, or due to it “crowding out” opportunities for lower-carbon sources of energy such as renewables.

I will briefly address each of these caveats.

On the first, that the U.S. economy would be better-served by curbing exports, there is significant *ex-ante* analysis, before U.S. LNG export growth, and additional empirical evidence, now that LNG export growth is underway, that the economic benefits from exporting LNG outweigh the gains to energy-intensive manufacturing that might accrue if exports were to be curbed.¹

On the second concern, environmental risks, it looks increasingly likely that local environmental risks are real and possible, but are not inevitable and can be avoided through responsible gas production, transport, processing, and utilization. However, this is unlikely to happen on its own in a uniform manner, and thus responsible regulation is both necessary and also serves to reward the most responsible, efficient U.S. operators with a competitive advantage.

On the third concern, interactions with decarbonization, the story is more complicated. Switching from coal to natural gas has been a major driver of recent greenhouse gas (GHG) emissions reductions in the United States. While the pace of coal-to-gas switching can be expected to slow in coming years, it will likely continue to be a positive story for the United States in providing energy not only with lower GHG emissions, but also delivering cleaner air, as well.

However, more can be done to ensure that gas maintains a clear edge over more carbon-intensive resources. The GHG emissions of natural gas, as a general rule of thumb, have traditionally been considered to be 40 percent lower than those of coal and 20 percent lower than those of oil on a per-unit of energy basis. However, as a recent report from the International Energy Agency has pointed out, the climate profile of gas depends upon responsible extraction, transportation, and utilization of the gas so as to avoid methane leakage. Methane is a potent greenhouse gas (GHG), with a short term radiative forcing (global warming) potential that is between 28–36 times more powerful than that of carbon dioxide over a 100-year time frame, and around 85 times more powerful over a 20-year time frame.

At current estimated average rates of methane leakage of gas production globally (a leakage rate of 1.7 percent of gas produced), the total climate impact of natural gas is still less than that of coal. However, the variance in methane leakage among different individual wells and operators is likely significant, again underscoring the

¹Michael Levi, *A Strategy for U.S. Natural Gas Exports*, The Hamilton Project, Brookings, June 2012.

importance of responsible regulations in order to ensure that American gas is some of the cleanest and most competitive in the world.

According to analysis by the International Energy Agency, producers can reduce greenhouse gas emissions by 75 percent simply by improving supply chain practices. About half of that can be cut at no net cost—i.e., they pay for themselves over the long term by monetizing the methane that is captured.²

Moreover, implementing only net negative cost measures could result in an equivalent long-term climate benefit as would be achieved by immediately shutting all existing coal-fired power plants in China.³

The other decarbonization concern associated with natural gas is that it may “crowd-out” lower-carbon forms of energy. So far, this appears not to be the case in most regions. Under proper market design, natural gas can serve as a “force multiplier” for renewables that enhances the value of renewable energy to the grid by balancing out the intermittency of wind and solar.⁴ Eventually, natural gas may also find new sources of demand that are consistent with long-term decarbonization trajectories, such as in the transport sector or vis-à-vis a hydrogen-based energy system that draws on existing natural gas infrastructure. Natural gas, then, can be a valuable tool in the transition to a more advanced energy economy in the United States and around the world.

Over time, it is possible that new technological advances and cost reductions will bring to bear lower-carbon options, such as renewables paired with energy storage or demand flexibility services, that compete directly with natural gas in some markets. Lithium ion battery costs were down to \$230 per kilowatt-hour in 2016, compared with almost \$1,000 per kilowatt-hour in 2010, and McKinsey & Co. projects that prices could reach \$200 per kilowatt-hour by 2020 and \$160 per kilowatt-hour or less by 2025.⁵ Storage is already economical for many commercial customers, and is increasingly being deployed by companies on-site to reduce peak-demand and avoid demand charges.

Already, there are signs of faster-than-expected cost decline trajectories for utility-scale renewables plus storage, with a recent solicitation from Xcel Energy in Colorado resulting in median bids of \$36 per megawatt-hour for solar-plus-storage, and \$21 per megawatt-hour for wind-plus-storage. These bids are for projects that would be delivered in 2023, and thus represent anticipated, rather than realized, cost reductions.

Nevertheless, over the next 10 years energy storage coupled with renewables and demand response may increasingly undercut the economics of coal as well as natural gas peaker plants.

This dynamic, however, would only seem to underscore the importance of focusing on the role of exports. LNG exports can be an important outlet for increasing domestic natural gas production as domestic U.S. gas demand growth begins to flatten. Over the next 5 years, the United States is poised to see a dramatic increase in LNG exports. With most outlooks foreseeing less than 6 billion cubic feet per day (Bcf/d) of demand growth, but nearly 18 Bcf/d of net supply growth, around 12 Bcf/d of new gas exports may be realized over the period. Of this, somewhere around 3 Bcf/d of the export increase is likely to be sent to Mexico via pipeline, while the remainder (8–10 Bcf/d) will be exported as LNG.

However, the United States is neither the least-cost LNG exporter, nor the closest to many key demand markets. In order to sustain and grow the global demand necessary to support continued U.S. LNG exports, it should support systemic drivers of global gas demand growth, including an accelerated transition from coal to gas in emerging markets. A number of studies have indicated that the lifecycle greenhouse gas emissions of U.S. LNG are lower than that of Russia, and as highlighted earlier there are ample opportunities to further reduce these lifecycle emissions over time. The United States is better-suited to deliver lower-carbon gas than many of its competitors, given both numerous homegrown technologies and innovations that help reduce emissions, as well as the comparatively more sophisticated environmental policy-making apparatus of the United States. The United States should not neglect these significant advantages.

² International Energy Agency, *World Energy Outlook 2017*, 14 November 2017.

³ Energy Institute, *Golden age of gas dependent on changing DNA of industry, new EI survey reveals*, press release, 19 February 2018, <https://www.energyinst.org/media-relations/media-centre/1735>.

⁴ NREL, *Opportunities for Synergy Between Natural Gas and Renewable Energy in the Electric Power and Transportation Sectors*, Technical Report, NREL/TP-6A50-56324, December 2012.

⁵ Paolo D’Aprile, John Newman, and Dickon Pinner, *The New Economics of Battery Storage*, McKinsey & Company, August 2016, <https://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/the-new-economics-of-energy-storage>.

Notably, the Paris Agreement on climate change may represent one of the most compelling opportunities to create future gas demand growth. A number of countries, including China, specifically identify natural gas as a GHG emissions reduction strategy to meet their Paris commitments, while others, such as India, do not mention natural gas but clearly have a compelling need for additional LNG imports if they are to enjoy an affordable, sustained supply of gas needed to wean the country off of coal. When the unambiguous clean air benefits of natural gas over coal are taken into account, its appeal for countries grappling with harmful smog and air pollution is all the more clear.

Latin America also represents a significant opportunity, and a logical nearby market, for U.S. LNG to contribute to decarbonization goals. LNG aided Brazil to maintain steady energy supplies during its historic drought periods of the mid-2010s, and many countries in the region are planning to expand LNG import capacity as part of their decarbonization strategies.

The United States should embrace, rather than retreat from, the broader trends shaping the global energy market in an increasingly climate-conscious world. Two additional points are worth making here: (1) advanced energy will represent the fastest growing segment of the energy market over coming decades and it is imperative that the United States play a leadership role; and (2) climate change not only shapes the energy market, but is a critical determinant of U.S. national security and likewise demands a leading role by the United States.

ADVANCED ENERGY, INNOVATION, AND U.S. LEADERSHIP

American hydrocarbon abundance should not obscure the importance of focusing strategy on the largest growth opportunities in the global energy sphere.

Global renewables deployment has gone from less than \$20 billion per year a decade ago to now enjoying the eighth consecutive year in which investment has been between \$250 billion to \$350 billion. The global head of the Blackrock Infrastructure Investment Group recently stated that renewables represent “almost 30 percent of the globally addressable market in infrastructure. This is no longer niche, it’s fundamental to any infrastructure allocation.”⁶ Wood Mackenzie, the energy consultancy, forecasts an annualized growth rate of 6 percent for wind and 11 percent for solar, compared with half a percent for oil and around 2 percent for gas, over the next 20 years.⁷ Last year, solar power grew by around 50 percent, with China accounting for approximately half of this growth.

Whereas Europe and the United States were once dominant players in renewable and advanced energy markets—and indeed, U.S. national labs played a critical role in the birth of modern photovoltaic solar technologies—other actors such as China are now playing a larger and larger role as they recognize not only the energy system and commercial opportunities of advanced energy, but also the geopolitical opportunities to shape markets early on, setting key standards and favoring certain technologies that accrue outsized domestic benefits. This is further magnified by concerns over energy security in countries less-rich in hydrocarbons than the United States.

Indeed, there may be limits to the heretofore exponential rise in China’s liquefied natural gas imports. In 2017, China became the world’s second largest importer of natural gas, after Japan, with an average of 5 billion cubic feet per day. China also finds itself increasingly dependent on imported oil, which now accounts for around two-thirds of its total oil demand. As Chinese concerns over gas and oil imports continue to grow, this in turn will drive further support for renewables and other advanced energy technologies that can reduce energy import reliance. It was widely reported at the beginning of this year that the city of Shenzhen in China has procured more electric busses—17,000—than the number of busses both conventional and electric in the five largest North American metropolitan fleets combined.⁸

The United States is not yet losing the advanced energy race, and still represents a significant market for the deployment of advanced energy. Renewables now generate almost as much electricity as the U.S. nuclear fleet, and if Texas were a country, it would be the fourth largest global producer of wind power. The largest wind farm in the free world is being built in Oklahoma.

⁶ CNBC, *Cost, not climate, is driving transition to renewables: BlackRock’s Jim Barry*, 23 February 2018, <https://www.cnbc.com/2018/02/23/cost-not-climate-is-driving-transition-to-renewables-blackrocks-jim-barry.html>.

⁷ Wood MacKenzie, *Could Renewables be the Majors’ Next Big Thing?*, 4 May 2017.

⁸ Steve Hanley, *Shenzhen Completes Switch To Fully Electric Bus Fleet. Electric Taxis Are Next*, Clean Technica, 1 January 2018, <https://cleantechnica.com/2018/01/01/shenzhen-completes-switch-fully-electric-bus-fleet-electric-taxis-next/>.

A key question, though, is whether the United States will invest in, and support, the historical source of its advanced energy edge—innovation. Deployment of today’s technologies is not enough. From the Department of Energy’s SunShot Initiative to the ARPA-E innovation agency and beyond, investment in advanced energy innovation today will continue to underwrite American energy security and competitiveness tomorrow. Energy innovation has been, and can continue to be, a defining strategic advantage of this country.

CLIMATE CHANGE AND U.S. LEADERSHIP

Finally, I would like to highlight the importance of climate change to these discussions, not only as an exacerbating factor of the risk landscape but also as an area where the abdication of U.S. leadership could have deleterious effects on broader U.S. economic and energy interests.

A historical lens reveals that the recognition of climate change as a U.S. national security risk driver is not a new, nor a partisan, phenomenon. In 1969, Daniel Patrick Moynihan—then an adviser to President Richard Nixon—wrote a memo to the president raising concern over the possible “apocalyptic change” represented by anthropogenic climate disruption, and called it an issue that the “[Nixon] administration ought to get involved with” and a “natural for NATO.”⁹ Climate change first appeared in the National Security Strategy in 1991 as an identified environmental challenge that does not respect international boundaries, and has been included in the Worldwide Threat Assessment since 2009 and the Quadrennial Defense Review since 2010.

This is not limited to threats that will draw on the utilization of our military assets abroad, but also poses challenges for our military’s own capabilities and readiness. A Department of Defense (DoD) report published in January surveyed 3,500 military sites in the United States and found that over half have already experienced climate-related challenges. This builds upon a 2009 DoD report which found that 128 coastal installations, including 56 naval installations valued at over \$100 billion, would be at risk if sea level rise of more than 1 meter were to occur. Recent projections of end-of-century sea level rise under current assumptions range from two-tenths of a meter to 2 meters.¹⁰

How might the United States best deal with these risks? The purpose of this hearing is not to contest the most appropriate instrument or approach for dealing with the climate challenge, but I would note the recent words of George David Banks, a climate and energy advisor who has served in both the George W. Bush and the Trump administrations:

“The Paris agreement is a good Republican agreement. It’s everything the Bush administration wanted . . . It’s a climate policy based on U.S. national interest that the Bush team started and the Obama team kept . . . The climate agenda is not going to go away any time soon, and if you’re not engaged aggressively, actively, there are going to be policies that are detrimental to the United States.”¹¹

I tend to agree with this assessment, and will briefly mention a number of ways in which lack of U.S. climate leadership may be detrimental to U.S. economic and national security interests.

Given that, if it were to leave the Paris Agreement, the United States would be the only country in the world not party to the Agreement, this would leave significant scope for future evolutions of the international climate governance regime over which the United States would have no say but would inevitably be impacted by. In the 1960s, when awareness of climate change was emerging, the United States accounted for 40 percent of global GDP. Today, it accounts for just over 20 percent. An isolated United States is not large enough to avoid the economic repercussions of agreements forged by the rest of the world.

For example, a number of foreign officials and politicians have floated the idea of tariffs, or even sanctions, being applied to the United States should it unilaterally withdraw from the Paris Agreement. With the opening of China’s national carbon market this year, a growing share of the global economy is under a formal carbon price, increasing the dangers of tariffs or other measures to be levied against juris-

⁹Nixon Library, *Memorandum from Daniel Patrick Moynihan*, 17 September 1969, <https://www.nixonlibrary.gov/virtuallibrary/releases/jul10/56.pdf>.

¹⁰NASA, *Understanding Sea Level: Empirical Projections*, <https://sealevel.nasa.gov/understanding-sea-level/projections/empirical-projections>.

¹¹Lisa Friedman, *Former Trump Aide Calls Paris Climate Accord ‘a Good Republican Agreement’*, 22 February 2018, <https://www.nytimes.com/2018/02/22/climate/george-david-banks.html>.

dictions without formal carbon pricing. The most punitive of these prospects would likely never occur. Some are distant but plausible. Others are already evident: the European Union is now refusing to complete a new trade agreement with any partner that has not only joined, but also officially ratified, the Paris Agreement. To take another angle, imagine if countries were to begin prioritizing LNG imports from countries that have ratified the Paris Agreement, just as the United States today provides preferential LNG export approval to countries which have a free trade agreement with the United States.

It is also worth noting that even in the absence of a Federal carbon price, there exists a complex mosaic of *de-facto* carbon prices across the United States. A wide range of regulations, from methane rules to fuel efficiency standards, create compliance costs that equate to an implicit price on carbon. For example, the 25 cent increase in the Federal gas tax that has recently been debated is the equivalent of a transport sector carbon price of around \$30 per ton.

A growing number of U.S. companies are pricing carbon voluntarily, as well. In 2017, almost 1,400 firms were integrating an internal carbon price into business decisions, a more than eightfold increase from 2013. Most large integrated oil companies now use internal carbon prices between \$40–\$80 per ton.

While this patchwork of *de-facto* carbon prices is better than no climate action, it nonetheless suffers from opacity, asymmetry, and—undoubtedly—inefficiency. A far more efficient and effective approach would be an economy-wide carbon price. This would level the playing field, encourage the lowest-cost carbon reductions to be harvested first, and would give the United States many more policy options for defending the competitiveness of its industry vis-à-vis competitors in countries both with and without carbon prices. A pragmatic, stable, predictable carbon price remains a prudent policy option for the United States.

CONCLUSION

In conclusion, the United States finds itself at a unique point in history in which its endowment of hydrocarbon resources, including natural gas, are re-shaping both domestic markets as well as, increasingly, the global energy landscape. While the growth of U.S. natural gas exports is poised to be a positive development for energy, economic, and climate security, this should be complemented by the strategies, investments, and policies necessary to ensure that gas maintains its relevance and value in the shift to more advanced and decarbonized energy systems in the United States and elsewhere. Moreover, excitement over the opportunities afforded by growing LNG exports should not distract from other critical priorities, including ensuring that innovation drives America's energy edge well into the future. Thank you for the opportunity to provide my thoughts on U.S. energy and geopolitics. I look forward to taking your questions.

Dr. GOSAR. Thank you, Mr. Livingston.
Ms. Gentle, you are up next for 5 minutes.

STATEMENT OF MEG GENTLE, PRESIDENT AND CEO, TELLURIAN, INC., HOUSTON, TEXAS

Ms. GENTLE. Thank you, Mr. Chairman, Ranking Member Lowenthal, and members of the Subcommittee. It is an honor to speak with you today about the role that U.S. liquefied natural gas production, exports, and investment plays in powering the global leadership of the United States and supporting the safety and security of our allies.

I serve as President and CEO of Tellurian, Inc., a 2-year-old company created to build a global natural gas business with the intention of spending nearly \$30 billion of investment in infrastructure in this country, including manufacturing dollars in 18 states, and creation of almost 50,000 direct and indirect jobs.

As I speak, we are witnessing change in the global energy system unprecedented in its scale and speed. Access to flexibly produced LNG allows countries from Eastern Europe, to East and South Asia, to our neighbors in our own hemisphere to diversify their

energy supply, diminish the power of sole-source suppliers, and access gas more quickly and at a lower cost. It helps countries meet their decarbonization goals, access more affordable electricity, and improve their air quality and, overall, improve their energy security.

We need your support to build out the infrastructure needed to meet domestic and global demand for gas. We can empower our friends and deny leverage to hostile powers while growing the U.S. economy and employing tens of thousands of Americans across our country.

The world is turning inexorably toward LNG. The International Energy Agency estimates that LNG will constitute 60 percent of the total inter-regional trade of gas by 2040, up from just 39 percent today. The world has seen a rapid increase in LNG importers in recent years, with 10 new importers added between 2011 and 2016 alone and a total of 38 countries now importing LNG.

Many of these are smaller, emerging importers which seek to grow their domestic gas markets for a range of security, public health, and climate-related reasons. Our southern neighbors Brazil, Chile, and Argentina rely on the spot markets to buy gas for base-load power and to back up their renewable energy.

Shorter, more flexible contracts, the steady decline of destination clauses, and the rise of floating storage and regasification technology has propelled LNG and innovative U.S. suppliers like Tellurian forward. The United States has played a key role in driving this transition of an LNG market from one dominated by a few powerful, inflexible suppliers to a commoditized, integrated global gas market.

The management team at Tellurian includes in its ranks the first innovators of destination-flexible contracts. This feature of U.S. LNG exports has helped bolster the energy security of our allies on every continent and disempower unfriendly and hostile regimes who would seek to use vital energy resources as bargaining chips or outright pressure. In Europe, Poland's ability to import LNG forced Russia to cut its export prices before a single molecule had actually been imported. Russia had little choice, as Gazprom depends on the European market for the bulk of its revenues.

Yet, despite these developments, Russian gas still supplies 40 percent of all of Europe's supply and exported 8 percent more gas to Europe last year. Even now, Russia seeks to expand its influence to growing markets in Asia through the \$55 billion Power of Siberia pipeline to China. In 2014, China and Russia executed \$400 billion in gas supply agreements.

In the Middle East, our allies Kuwait, the United Arab Emirates, Israel, Egypt, and Jordan have started importing LNG to produce electricity and potable water. The IEA noted in its 2017 World Energy Outlook that, next to Asia-Pacific, the Middle East region will experience the greatest total gas demand growth in the coming decades, at approximately 2.2 percent per annum.

The power sector drives the bulk of this growth. UN data shows that our allies in the Middle East power generation from burning oil was equivalent to the amount of electricity generated by the great state of Ohio.

LNG imports can enhance the electric grids of these nations and provide security of supply. Natural gas demand to fuel desalinization facilities is also key, as the water-scarce region requires more water to support its growing population.

In Asia, hundreds of millions of people remain without access to reliably and cleanly produced electricity. An analysis produced from a joint CSIS and IEA workshop in May 2017 noted, “Asian countries, including India, will continue to be the dominant forces globally in terms of demand for growth for LNG.” Among these are Japan and Korea, critical U.S. allies, as well as China, which has relied on LNG to address grave air quality concerns.

We at Tellurian are up for the challenge of continuing to support our allies and worldwide energy security. Tellurian stands firm behind supporting expanded access to clean American energy, enhancing diversity of supply, ending price discrimination and undermining those who practice it, and enabling energy transitions to lower carbon fuels throughout the world.

Simultaneously, LNG exports will continue to help the American people by creating thousands of jobs and fueling expansion of the economy while having limited effect on domestic natural gas prices given continued increases in shale productivity.

Tellurian plans to invest \$29 billion in natural gas and LNG infrastructure, but we need additional infrastructure across the value chain to ensure American energy remains competitive. We ask policy makers to encourage the infrastructure investments which will support our industry and ultimately our geopolitical goals.

[The prepared statement of Ms. Gentle follows:]

PREPARED STATEMENT OF MEG GENTLE, PRESIDENT AND CHIEF EXECUTIVE OFFICER,
TELLURIAN INC.

THE GEOPOLITICAL IMPERATIVES OF EXPANDED U.S. NATURAL GAS PRODUCTION AND
INFRASTRUCTURE INVESTMENT

Mr. Chairman, Ranking Member Lowenthal and members of the Subcommittee, it is an honor to speak with you today about the role that U.S. liquefied natural gas (LNG) production, exports and investment plays in bolstering the global leadership of the United States and the safety and security of our allies.

Recent years have brought tremendous change across global energy markets, including the dramatic expansion of the LNG trade. The U.S. shale gas revolution has been a boon for the American people as the application of new technologies has opened trillions of cubic feet of cleaner-burning natural gas for U.S. consumption.

Exporting natural gas as LNG continues to benefit the American people by creating thousands of jobs and stimulating economic expansion. We expect our Driftwood LNG project alone to create at least 13,000 jobs while supporting manufacturing jobs in 18 U.S. states. U.S. LNG exports advance American geopolitical interests and leadership by strengthening the energy security of our allies and improving air quality through cleaner-burning natural gas. The United States is positioned to lead a global energy transformation as countries around the globe grapple with an array of energy modernization and climate challenges.

These benefits can only be achieved through a continued partnership of all public and private constituents that support American LNG’s cost-competitiveness. Other nations such as Russia and Qatar continue to grow their LNG export capacity, expanding their financial, geopolitical, and industrial influence. Timely infrastructure investment for pipelines and export facilities will be essential to support continued U.S. leadership in the global LNG market. Our team at Tellurian can support U.S. geopolitical goals by offering low-cost gas supply and flexible terms, but even our plans to invest \$29 billion in American infrastructure are insufficient to meet this growing challenge. With more investment in American energy infrastructure, the

United States is uniquely positioned to support global energy security and air quality through a leadership position in LNG markets for decades.

A Changing Market

The LNG market is rapidly commoditizing. Traditionally, LNG has been traded through rigid, long-term contracts with large volumes at a price indexed to oil. Today, LNG is increasingly traded in short-term and spot markets, with prices reflecting global supply and demand balances. This price transparency has supported natural gas demand growth in financially challenged regions and countries, providing nations with an environmental and cost-competitive alternative to coal.

These changes support a new wave of LNG buyers worldwide and create an advantage for suppliers who can compete with low-cost supply. The development of a spot market enables countries with varying degrees of credit worthiness to access LNG supplies without signing long-term contracts. The world has seen a rapid increase in LNG importers in recent years, with 10 new importers entering the market between 2011 and 2016 and a total of 38 countries importing LNG at the end of 2017.

LNG exports from the U.S. lower-48 began from Sabine Pass in 2016, with cargoes destined for emerging importers in our own hemisphere, such as Brazil, Chile, and Argentina, which rely almost exclusively on the spot markets. Some buyers purchase on a seasonal basis based on hydroelectric variability, others as a backup for renewables, and still others to deal with disruptions in supply. The rise of floating storage and regasification units (FSRUs) has made it easier for other countries to quickly access low-cost LNG supplies. FSRUs enable gas buyers to access LNG supplies within months rather than years while minimizing the cost to build infrastructure. By year-end 2017, 40 percent of LNG importers used FSRUs, and IHS forecasts that over 50 percent of import markets will use FSRU terminals by 2025.

The United States is uniquely positioned to supply this heterogeneous market. With a stable and reliable regulatory environment, low-cost gas, skilled labor, and flexible contract terms, we can be the preferred supplier to the world. Indeed, Tellurian is pioneering a low-cost, flexible and reliable LNG supply model ideal for a maturing commoditized market. Customers have the opportunity to invest in Driftwood LNG to access gas at cost for approximately \$3/mmBtu on the beach. Tellurian stands at the forefront of the LNG revolution, positioned to compete in a rapidly evolving market.

Geopolitical Impacts of the New Market

The United States has played a key role in driving this transition of an LNG market dominated by a few powerful, inflexible suppliers to a commoditized, integrated global gas market. The management team at Tellurian includes in its ranks the first innovators of destination-flexible contracts. This feature of U.S. LNG exports has helped bolster the energy security of our allies on every continent and disempower unfriendly and hostile regimes which seek to use vital energy resources as bargaining chips or outright pressure.

In Europe, the transformative effect of LNG imports has been enormous. The flexible nature of LNG has allowed European buyers dependent on a single supplier of pipeline gas to access the same fuel, but with a greater diversity of suppliers and sources. By offering a wider range of suppliers, LNG introduces price competition. Lithuania, hitherto an energy island in Europe, successfully negotiated lower gas prices from its traditional gas supplier just by publicly engaging in talks with potential LNG suppliers. Lithuanian President Dalia Grybauskaitė has said the ability to import LNG would put an end to the “existential threat” of relying on one supply source.

Russia seeks to expand its market share to growing markets in Asia, notably through the \$55 billion Power of Siberia pipeline to China, a \$13 billion pipeline to Turkey, and the new Yamal LNG export terminal in its far east. In 2014, China and Russia concluded \$400 billion in gas supply agreements and Russia intends to build additional pipelines to serve growing Chinese demand. Low-cost LNG supplies from the United States offer gas buyers in Europe, Asia and around the world an opportunity to diversify their energy mix.

U.S. LNG exports can also fuel economic development and help meet basic human needs for many of our allies and friends around the world. Hundreds of millions of people remain without access to reliable and cleanly produced electricity, including nations in the Middle East, Asia, Latin America, and Sub Saharan Africa. Even those with access to electricity often face severe air pollution, harmful to human health and the global environment. Low-cost, clean, and reliable LNG can help tackle these issues and improve diplomatic relationships with our allies.

The Middle East, including our allies in the region—Kuwait, the UAE, Israel, Egypt, and Jordan—has started importing LNG in the last 8 years to produce electricity and potable water. The IEA noted in its 2017 World Energy Outlook that next to Asia-Pacific, the Middle East region will experience the greatest total gas demand growth in coming decades, consuming an additional 318 bcm in the period to 2040, equivalent to a fifth of global growth in that time frame. The power sector drives the bulk of this growth; UN data shows that our allies in the Middle East burned around 168 TWh of oil to generate electricity, equivalent to all the electricity consumed in the great state of Ohio in 2016. Natural gas demand to fuel desalination facilities is also a key demand driver, as the water-scarce region requires more water to support its growing population. Supplying LNG to this dynamic region directly supports our allies' energy security and, by extension, our military and diplomatic presence.

The same is true in Asia, where hundreds of millions of people remain without access to reliable and cleanly produced electricity. A CSIS analysis "U.S. Natural Gas in the Global Economy," produced from a joint CSIS-IEA workshop in May 2017, noted "Asian countries including India will continue to be the dominant forces globally in terms of demand growth for LNG." Among these are Japan and Korea, critical U.S. allies in the region that consumed a combined 42 percent of global LNG in 2017.

China has relied on LNG to address grave air quality concerns; in this winter alone, China installed gas heaters in 5.54 million households in northern China to reduce particulate emissions. The environmental impacts were immediate, as residents reported cleaner air and blue skies atypical of Chinese winters. However, 426,000 of these households reported gas shortages despite record purchases of LNG to satisfy this increased demand for cleaner burning fuels. Not surprisingly, the IEA estimates that China will account for 40 percent of total global natural gas demand growth between now and 2022—but China must have ample supply to meet its ambitious coal-to-gas switching targets.

India, similarly, will be the other major driver of global economic growth; despite similar air pollution and public health problems as those facing China, Bloomberg New Energy Finance notes that in 2016 India added 16 GW of new coal-fired generation—nearly double the total amount of renewable capacity added that year. Natural gas is well-suited to meet India's energy modernization challenges and bridge the gap between its stated climate and pollution goals and its tremendous need for more power. Its government has invested accordingly: this month, the Indian government announced that its current 4 LNG terminals will be augmented by 11 new terminals over the next 7 years as part of plans to have natural gas contribute 15 percent of its energy mix by 2020. Spot LNG supplies will be vital for these new terminals, many of which will support India's enormous and growing coastal cities.

U.S. exports to Asia can fill the gap and help meet future energy demand growth—but natural gas must be cost competitive and widely available to compete with coal in this region. If this massive continent continues to rely on coal to generate its accelerating power demand, these nations will not meet their targets under the Paris climate agreement and the global climate consequences could be grave. Indeed, the United States is in a historic position to be a world leader in reducing pollution and improving air quality around the world, saving millions from dying from preventable environmental diseases. For many governments facing these public health threats, air quality is the driver for a coal-to-gas transition, more than climate change alone. One study last year suggested that Sub Saharan Africa alone saw over 175,000 preventable deaths in the region due to air pollution. Positioning the United States as a leading supplier of a fuel resources which could dramatically improve these problems is more than just good business—it's good policy. It is the essence of "smart" power, leveraging America's energy abundance help meet basic humanitarian needs throughout the world.

Investment in Infrastructure

The prolific U.S. natural gas resource base can support American geopolitical, environmental and economic goals, but only through sustained investment, initially totaling \$170 billion over 5 years in U.S. natural gas infrastructure to support expected production growth. Earlier this month, the Energy Information Agency (EIA) forecasted that natural gas production will reach 80.3 Bcf/d in 2018, establishing a new record. We expect natural gas production to grow 20 Bcf/d by 2025 from five shale basins alone.

However, this natural gas is at risk of being stranded or flared without additional investment in pipeline and LNG infrastructure. There are six U.S. LNG export terminals approved by the Federal Energy Regulatory Commission (FERC), under

construction, and existing, providing over 9 Bcf/d of LNG export capacity. Based on the pace of natural gas production, the United States requires 13 Bcf/d of new natural gas transportation and export infrastructure to support incremental gas output. Indeed, a recent BTU Analytics report noted that U.S. gas production growth may be limited to the total capacity and utilization of LNG export facilities, suggesting that the United States can produce as much LNG as the global gas market can absorb.

Typically, LNG infrastructure operates under a long multi-year development cycle, where the speed at which decisions are made today will impact the ability of the United States to supply low cost gas 5 years from now. We are far from the only ones with an eye to the future. Qatar recently announced that it will increase LNG output by 30 percent, Australia is moving ahead with new LNG export infrastructure, and Russia is planning new liquefaction plants while laying miles of pipelines across Eurasia. Perhaps most importantly, our allies want to buy our gas. The same CSIS analysis mentioned earlier also notes, "Many already well-established LNG import markets in Asia have looked toward U.S. LNG for diversification of both supplies and contractual terms . . . Asian importers seem to recognize that the value of U.S. LNG goes beyond price; it alleviates the region's heavy reliance on the Middle East and the Asia-Pacific for LNG and attendant maritime chokepoints, such as the Straits of Hormuz and Malacca." The United States clearly enjoys many advantages, but our valuable supply stands at risk of being left behind if we don't build infrastructure now.

Tellurian plans to invest \$29 billion in natural gas and LNG infrastructure, but we need additional infrastructure across the value chain to ensure American energy remains competitive on a global basis. In addition to laying the literal groundwork for U.S. gas exports, the importance of a supportive, efficient policy and regulatory environment for natural gas cannot be overstated. The potential is undeniably there, but the United States must make deliberate decisions today to realize the opportunity before it as we pursue "energy dominance" in the years to come.

Conclusion

The United States is well positioned to help make the global LNG market more competitive by providing low-cost supply on flexible terms to buyers everywhere while empowering our friends and allies to have greater control over their energy security. Tellurian stands firmly behind supporting expanded access to American energy, enhancing diversity and security of supply, ending price discrimination and undermining those who would practice it, and enabling energy transitions to lower carbon fuels throughout the world. To reach this goal we must make investments today that will enable our leadership in global markets in the years ahead. We encourage policy makers to advance the supportive dialogue regarding infrastructure development and investments which will help the energy industry play a leading role in supporting America's international and geopolitical goals.

QUESTIONS SUBMITTED FOR THE RECORD BY REP. LOWENTHAL TO MS. MEG GENTLE,
PRESIDENT AND CEO OF TELLURIAN, INC.

Question 1. During the hearing, you appeared to indicate that you did not believe that anthropogenic emissions are the main driver of climate change. Could you please clarify your position on this issue?

Answer. Yes. Humans definitely contribute to climate change. In fact, it is our responsibility to reduce and mitigate human emissions, and we take that responsibility very seriously in our operations.

Dr. GOSAR. Thank you, Ms. Gentle.
I now recognize the Ranking Member, who showed up, my friend Mr. Lowenthal.

**STATEMENT OF THE HON. ALAN S. LOWENTHAL, A
REPRESENTATIVE IN CONGRESS FROM THE STATE OF
CALIFORNIA**

Mr. LOWENTHAL. Thank you.

I thank the Chairman for allowing me to give my opening statement after the witnesses, and I thank the witnesses for putting up with me.

Dr. GOSAR. Do I get to question you?

Mr. LOWENTHAL. Yes, you do. You always get the chance to question. But this should not be counting on my time.

The topic of today's hearing is something that would have been unthinkable 10 years ago. Back then, U.S. oil and gas production was going down, imports were going up, and members of this Committee were being urged to immediately open the Atlantic Ocean to new drilling because we were in desperate need of more natural gas.

Today, U.S. natural gas production is at record levels, U.S. oil production is near record levels and climbing, and we are seeing soaring volumes of exports, not imports.

Nearly all of this turnaround happened during President Obama's time in office. While the Republicans rarely accept this, oil production on Federal lands went up nearly 80 percent under President Obama. He signed the law ending the crude oil export ban, and his administration approved 24 natural gas export licenses.

But President Obama had a real all-of-the-above strategy, not just fossil fuels. He made the deployment of renewable energy a top priority while also acknowledging that all forms of energy development have impacts that must be addressed.

Summary—natural gas is seen as a very important but as an intermediate solution. It is not the long-term solution for our energy needs.

What is that long-term solution? Well, we have already begun to measure it. Wind power in the United States quadrupled under President Obama, while solar power grew almost 40-fold. When he took office, there were no solar plants on public lands. When he left office, 34 had been approved, with a potential capacity of nearly 10,000 megawatts.

All told, solar and wind generation in the United States has nearly quadrupled since 2008, generating almost 20 percent of U.S. electricity last year.

But we are not doing enough. Global carbon emissions continue to rise, and the impacts of climate change have become evident. In 2017, it is the third year in a row that every single state in the Lower 48 had above-average temperatures.

President Obama took this very seriously by signing us onto the Paris Accord and making meaningful commitments to cut emissions. President Trump only has a single agenda—more fossil fuels—all in the service of an ill-defined agenda of geopolitical bullying which he calls “energy dominance.” But this is like saying that we are going to achieve telecommunications dominance by making ourselves the world leader on landline telephones.

Focusing on the energy of the past and ignoring the impacts of climate change is not a formula for being dominant. It will simply marginalize us internationally and handicap us economically.

Other countries are already bypassing us in advanced energy investments. Last year, a major energy consulting firm dropped the United States to third place in the rankings of the most attractive countries for renewable energy investment, behind China and India. These two countries are now leading the world in deploying renewable energy, and both governments are setting ambitious renewable energy targets and attracting tremendous private-sector investments.

In January of 2017, China announced that it would invest \$360 billion in renewable energy by 2020, a move that is forecast to create over 13 million jobs and to help reduce hazardous air pollution. India has pledged to install 100 gigawatts of solar and 60 gigawatts of wind by 2022.

It goes without saying that both nations are party to the Paris Accord, because every single nation on Earth is party to the Paris Accord—at least, they all will be until President Trump makes us the odd country out.

Developing more renewable energy and increasing investments in innovative technology is a win-win for our climate, our security, and our economic competitiveness.

I am pleased with this hearing, because we are looking today at some of the bigger-picture issues around energy and where we are moving toward. But I hope that this means we will soon have hearings on climate change and renewable energy in this Subcommittee. If we care about geopolitical strength as much as we say, we will give climate change the attention it rightfully deserves.

I thank the witnesses for being here, and I yield back. And I thank the Chairman for allowing me to speak.

[The prepared statement of Mr. Lowenthal follows:]

PREPARED STATEMENT OF THE HON. ALAN S. LOWENTHAL, RANKING MEMBER,
SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES

Thank you, Mr. Chairman, and thank you to the witnesses for being here.

The topic of today's hearing is something that would have been unthinkable 10 years ago. Back then, U.S. oil and gas production was going down, imports were going up, and members of this Committee were being urged to immediately open the Atlantic Ocean to new drilling because we were in desperate need of more natural gas.

Today, U.S. natural gas production is at record levels, U.S. oil production is near record levels and climbing, and we're seeing soaring volumes of exports, not imports.

Nearly all of this turnaround happened during President Obama's time in office. While Republicans hate to accept this, oil production on Federal land went up nearly 80 percent under President Obama. He signed the law ending the crude oil export ban. And his administration approved 24 natural gas export licenses.

But President Obama had a real all-of-the-above energy strategy, not the Fossils First approach of this Administration, and he made the deployment of renewable energy a top priority, while also acknowledging that all forms of energy development have impacts that must be addressed.

Wind power in the United States quadrupled under President Obama, while solar power grew more than 40-fold. When he took office, there were no solar plants on public lands. When he left office, 34 had been approved with a potential capacity of nearly 10,000 megawatts.

All-told, solar and wind generation in the United States has nearly quadrupled since 2008—generating almost 20 percent of U.S. electricity last year.

Still, global carbon emissions continue to rise, and the impacts of climate change have become evident: in 2017, for the third year in a row, every state in the Lower 48 had above-average temperatures.

President Obama took this issue seriously, signing the United States onto the Paris Accord and making meaningful commitments to cut emissions. President Trump has only one agenda: more fossil fuels. All in the service of an ill-defined agenda of geopolitical bullying he calls “energy dominance.” But this is like saying we’re going to achieve telecommunications dominance by making ourselves the world leader in corded telephones.

Focusing on the energy of the past and ignoring the impacts of climate change is not a formula for being dominant. Instead, it will simply marginalize us internationally and handicap us economically.

Other countries are already bypassing us in advanced energy investments. Last year, a major energy consulting firm dropped the United States to third place in the rankings of the most attractive countries for renewable energy investment, behind China and India. Those two countries are leading the world in deploying renewable energy, and both governments are setting ambitious renewable energy targets and attracting tremendous private sector investments.

In January 2017, China announced the country would invest \$360 billion in renewable energy by 2020—a move that’s forecast to create over 13 million jobs and help reduce hazardous air pollutants.

India has pledged to install 100 gigawatts of solar and 60 gigawatts of wind by 2022.

It goes without saying that both nations are party to the Paris Accord, because *every single nation* on Earth is party to the Paris Accord—at least, they all will be until Donald Trump makes us the odd man out.

As a nation, one of our great strengths has been our ability to lead. Not to dominate, but to lead. In countless fields, from science and medicine to computers and the space program, we have led the world and created entirely new industries that now form the foundation of our economy and are responsible for tremendous numbers of jobs.

This Administration has decided leadership, much like their energy policy, is a thing of the past.

While this Administration tries to resuscitate the coal industry, our competitors are positioning their economies and equipping their workers for the 21st century.

Deploying more renewable energy and increasing investments in innovative technology is a win-win-win for our climate, our security, and our economic competitiveness.

I’m pleased that with this hearing we’re looking at some of the big picture issues around energy, and I hope this means we will soon have hearings on climate change and renewable energy in this Subcommittee.

If we care about our geopolitical strength as much as we say, we’ll give climate change the attention it rightfully deserves.

I thank the witnesses again for being here, and I yield back.

Dr. GOSAR. Thank you to the Ranking Member.

And I thank the panel for their testimony.

Reminding the Members that Committee Rule 3(d) imposes a 5-minute limit on questions. I will recognize Members for their questions that they may ask the witnesses. I am going to start first.

Mr. Livingston, your testimony highlights an increased demand for lithium to store solar and wind power. Quite frankly, renewable energy storage technology is not very efficient. And our domestic mining industry is shackled by regulatory roadblocks and environmental lawsuits.

Are you advocating for an increase in domestic metallurgical mining to meet this demand?

Mr. LIVINGSTON. Thank you very much, Chairman Gosar.

I am not advocating for any specific activity—

Dr. GOSAR. Why not? Because if this is an issue, this is a critical pathway. So, why aren’t you?

Mr. LIVINGSTON. Certainly. I would hope that the market will serve that——

Dr. GOSAR. You don't hope markets. I mean, this has to have an active supply chain. So, you can't hope. You have to be engaged one way or the other. How do you stand?

Mr. LIVINGSTON. I think this issue would merit, indeed, a government-focused policy of exploring different options of better understanding the U.S.——

Dr. GOSAR. What are those options?

Mr. LIVINGSTON. That would include better understanding the U.S. resource base and certain critical minerals. However——

Dr. GOSAR. How is that any different right now that we are dictated 100 percent by China with some of these critical minerals that are essential to these batteries?

Mr. LIVINGSTON. I would say not 100 percent, though China is a——

Dr. GOSAR. Pretty darn close. It is 99.9 percent when you continue to look at outside supply chains.

Mr. LIVINGSTON. Very true. Chile, Peru, Bolivia are also significant players in lithium. Brazil is a——

Dr. GOSAR. And if you look at who controls those assets, they go through China.

Mr. LIVINGSTON. That may be an increasing case in some circumstances.

What I would endorse, to answer your question, is I do think that there is a role for a more strategic look on the part of the United States at what is the mineral base both here and around the world; what is the degree of substitutability for some of these minerals and different technologies. We don't want to find ourselves chasing certain minerals when the technologies themselves could easily substitute for another mineral which is more abundant here in the United States.

Dr. GOSAR. Well, we are constantly doing that already.

I have limited time, so a second question to you is, how is natural gas necessary to meet all base-load energy requirements?

Mr. LIVINGSTON. Natural gas is, in my view, a very important part of an advanced energy system in the United States. It is potentially, particularly at this moment, an important force multiplier for renewables, as well, in many different markets. It can serve to balance out the intermittency of solar and wind resources.

It is cleaner than coal and has many attractive characteristics on its own, in terms of faster ramp-up and ramp-down times. It is for this reason that natural gas plants in the United States are more attractive than coal peaker plants in a number of different jurisdictions.

Dr. GOSAR. OK. I have limited time, so I think we will end that.

Mr. Doran, over the last few years, increased U.S. production of oil and natural gas has significantly impacted the global energy marketplace. In particular, our energy exports are helping to foster a more dynamic and diverse global energy market.

This is providing international customers with greater choice and helping to curb the use of energy as a political weapon. In fact, many of our European allies see our energy exports as a game-

changer to help break their dependence on regimes like Russia that use energy to influence their neighbors.

What role do you see the U.S. energy production and exports playing in global energy security?

Mr. DORAN. Thank you, Mr. Chairman. I really appreciate the question.

I would say if we look at what we face right now, we are in an environment of heightened competition. In the energy space in Europe, that competition is Russia.

We have to ask ourselves, what does Russia fear? Russia fears our ability to break its monopolistic business practices. And we could do that through the increased export of American LNG to markets that want it.

Dr. GOSAR. You bring up a good point, because we just went to Germany this last summer, and we had a nice conversation with the German energy ministry, which gave us a whole portfolio in regards to alternative energy.

Then the next day we went to Eurocom, based out of Germany. And my question to them was, where do you get your energy? It is a contract through Germany. And my comment is, where do you get your base load?

You can't tell me that our base load is then going to come from Nord Stream 1 and 2. That is such an oxymoron. I can't believe it, that we have such a disdain for Russia that we would actually allow that to be base-load energy with our military.

Do you see a quandary in that?

Mr. DORAN. I do. And I think, Mr. Chairman, you have identified one of those hidden costs that Russia imposes on its customers. There is no such thing as cheap Russian gas. There are hidden costs, and you have identified one.

Dr. GOSAR. And utilizing the country of Lithuania, which is actually a valuable lesson. Here they were 100 percent dictated on their energy dependence by Russia, and now, with liquefied natural gas, they are less than 30 percent.

Do you look at that as one of the forecasting models for the future?

Mr. DORAN. I hope so. When we look at options, that is the important part. Just the ability to have alternatives to Russia, in the case of Lithuania, has actually decreased Lithuania's natural gas price by 55 percent and lowered Russia's total imports by 65 percent to Lithuania.

That is what victory in an energy competition looks like. And in the case of Lithuania, America is starting to win. We want that for the rest of our allies.

Dr. GOSAR. Thank you, Mr. Doran.

I now yield 5 minutes to the Ranking Member for his questions.

Mr. LOWENTHAL. Thank you, Mr. Chair.

I would like to make a statement, one short statement, before I ask questions, that while we are talking about LNG exports, this is an opportunity also to support local American shipbuilding by requiring a small percentage of exported crude and LNG to travel on U.S.-built and U.S.-flagged vessels.

Congressman Garamendi is soon going to be introducing the Energizing American Shipbuilding Act in the near future which

would do exactly that. I am not here to say support or not, I just hope that we at least look at that to make sure that American shipbuilding also benefits by the growth of LNG.

My first question is for all the witnesses. Yes or no, just simply, and we will start off right away with Mr. Smith. Are human emissions from burning fossil fuels the primary driver of global climate change? And do you believe climate change is a threat to our society and the economy?

Mr. Smith?

Mr. SMITH. Yes.

Mr. LOWENTHAL. Next, Mr. Doran?

Mr. DORAN. I am not a climate scientist, so my answer has to be "I don't know."

Mr. LOWENTHAL. You are a "don't know."

Next, Mr. Livingston?

Mr. LIVINGSTON. Yes.

Mr. LOWENTHAL. And Ms. Gentle?

Ms. GENTLE. I am not an expert on climate change. I do not believe that human emissions are the primary driver of climate change.

Mr. LOWENTHAL. Thank you.

We have two yes's, one not an expert, and one who does not believe that human emissions are the primary.

Mr. Livingston, in June of last year, President Trump announced his intentions to withdraw the United States from the Paris climate agreement. In his Rose Garden speech, he said participating in the Paris Accord would, "undermine our economy, hamstring our workers, weaken our sovereignty, impose unacceptable legal risks, and put us at a permanent disadvantage to the other countries of the world."

Is this true? If not, what would you say will be the most significant geopolitical impact if the United States fully withdraws from the Paris Agreement?

Mr. LIVINGSTON. Thank you very much, Representative Lowenthal.

I would underscore some of the comments I made in my opening statements again, in that I agree with Mr. Banks, adviser to both George W. Bush and to President Trump, on this issue in that the Paris Agreement should not be viewed as a partisan issue. I don't think the Democrats or Republicans have a monopoly over the issue of climate change, nor do I believe any one party has a monopoly over any one energy source. These should be non-partisan, American issues.

A few features of the Paris Agreement are worth noting. It is indeed a flexible agreement. The United States can adjust its commitment unilaterally at any time it wishes to with no penalties therein. It involves all countries. China and India are also required to make commitments, which was not previously the case in other international climate policy architectures that were being attempted prior to the Paris Agreement's formulation.

So, it displays a number of characteristics which were indeed the intended outcome of early efforts by Republican administrations, including the George W. Bush administration, to address the global challenge of climate change.

In terms of the repercussions should the United States leave, as I mentioned, I do think it will open up the United States to unnecessary risks of action, particularly vis-à-vis trade, imports, tariffs, carbon border adjustments, et cetera. So, I would note that the downsides of leaving the Paris climate agreement are both uncertain and unnecessary.

Mr. LOWENTHAL. Thank you.

I want to follow up. You mentioned China and India, and I also indicated earlier that they are investing billions of dollars in renewable energy development, and both made ambitious commitments under the Paris Agreement to reduce their emissions. However, both nations are two of the top fossil fuel consumers and greenhouse gas emitters in the world.

How are we supposed to believe that China and India really care about climate change and want to assume, kind of, global leadership positions when they are two of the biggest contributors to the problem?

Mr. LIVINGSTON. It is a very good and fair question, and it is a question which is often asked and should be. The points I would make are twofold.

In terms of motivations, Number one, one need not believe that they care about climate change, first and foremost, as the driver of their actions. It is enough to simply look at air qualities in cities such as New Delhi, Beijing, et cetera, to understand why they are taking action on moving coal generation outside of cities or near cities, why they are moving to cleaner forms of energy. So, air pollution being one factor and the political legitimacy questions that are involved therein.

The second is that, increasingly, these countries see industrial policy benefit to moving on climate and, in particular, are becoming exporters of clean energy technologies and advanced energy technologies.

Mr. LOWENTHAL. Thank you, Mr. Chair, and I yield back.

Dr. GOSAR. I thank the Ranking Member.

The gentleman from Colorado, Mr. Lamborn, is recognized for 5 minutes.

Mr. LAMBORN. Thank you, Mr. Chairman, for having this hearing.

Thank you to all the witnesses for being here.

I am not going to ask about the Paris Accord, because that is really not the topic that we were supposed to be discussing today. It is LNG and U.S. geopolitics.

Mr. Doran, I see in the news that Boston recently received, about a month ago, a big shipment of LNG from Russia. What is wrong in the Northeast where they are taking Russian natural gas? We have tons of natural gas in the United States if you go farther west than the Northeast. What is wrong with this picture?

Mr. DORAN. Thank you, Congressman.

I would put it pretty straightforward: for Vladimir Putin, it is personal. Liquid natural gas has become a heightened field of competition, and Russia is increasingly trying to compete with the United States. That is something this Committee should keep an eye on.

Mr. LAMBORN. Why does Boston and the Northeast have to get it all the way from the Arctic in Russia instead of from pipelines closer, by domestic states that are inside the United States?

Mr. DORAN. As this Committee knows, one of the things that we are trying to see is an increased level of globalization in the liquid natural gas market. So, increasingly, we are going to see, I hope, LNG acting like a barrel of oil, where you can buy and sell it, it is a fungible commodity that you can buy and sell it anywhere in the world.

The fact that Russia wanted to sell its natural gas to Boston, I would propose to this Subcommittee, was a political act and not necessarily a fundamental economic act on the part of Russia or downstream consumers.

Mr. LAMBORN. Mr. Smith, would you agree with me that there are problems with permitting of and allowing of pipelines in the Northeast to bring gas in from the West?

Mr. SMITH. Yes. Thanks for the question, Congressman.

We are not a producer, we are an LNG exporter. We benefit from having natural gas we bring from numerous states down to our facility. We have actually been able to create a supply chain that allows us to ensure that we have reliable sources of natural gas and that we don't have constraints.

Other parts of the country have seen some transportation constraints and some pipeline constraints. That is driving some price spikes, when you have some irregular weather or other things that create volatility in local Citygate prices. And given that we do have an increasingly liquid global market for LNG, it is going to attract cargos in from different places.

We think this was probably a one-off in terms of having a very high price spike that is driven by shortages in transportation, but that is probably what is behind that.

Mr. LAMBORN. Ms. Gentle, are you able to comment on permitting problems in the Northeast for gas pipelines?

Ms. GENTLE. Tellurian is also not active in the Northeast. We have always pursued a philosophy that we will build infrastructure in communities where they welcome the infrastructure and jobs in the local community.

Mr. LAMBORN. OK.

Then, for you and Mr. Smith, for the export facilities that allow LNG exports, are there any permitting issues that are outstanding today?

I know that the Trump administration is, in my opinion, more reasonable in terms of allowing permitting to go forward. I think the Obama administration made a start, but we are building on what was just started in the last administration.

Mr. SMITH. Thank you for the question.

As we look at the market, there are over 20 billion cubic feet of natural gas that has been permitted for projects. Currently, about 10 billion cubic feet are being constructed.

As we look at our process and the processes that Cheniere has gone through, we don't see permitting as the primary issue. There are still commercial issues. It is still a challenging market.

Cheniere is having some success in signing long-term contracts to take natural gas to destinations around the world, again, in a

way that creates value in the United States, creates U.S. jobs, and helps our balance of trade.

There are financing issues and commercial issues, but we don't see the primary problem as being permitting. I think that is something we have been able to——

Mr. LAMBORN. Ms. Gentle, to finish out, do you have anything to add?

Ms. GENTLE. We have \$17 billion worth of infrastructure sitting in the FERC amid the permitting process. We have long enjoyed a very good partnership with the FERC. On a global scale, it is a very transparent and clear regulatory process.

We were set back a little bit by the lack of the quorum at the FERC, but we are very happy to now have a clear pathway forward and a scheduling notice. We are the only company that is developing LNG infrastructure that has a scheduling notice in their FERC process and also has a signed EPC contract to move forward with construction.

And we are very enthusiastic about the Administration's continued support for a streamlined and efficient regulatory process.

Mr. LAMBORN. OK. Thank you all.

Dr. GOSAR. I thank the gentleman.

The gentleman from Virginia, Mr. Beyer, is recognized for 5 minutes.

Mr. BEYER. Thank you, Mr. Chairman, very much.

First, I want to start out by highlighting that the Majority memo discusses how NEPA is problematic in the approval of the construction of LNG terminals, specifically citing the frivolousness of how NEPA allows for public comments and for environmental concerns like greenhouse gas emissions.

So, let me defend NEPA using real-time Virginia examples. Because FERC was considering two pipelines in my Commonwealth, and separately, not together, one of which, the Mountain Valley pipeline, will destroy about 100 miles of the Appalachian Trail.

And here is the thing—we don't need two new pipelines. The demand isn't there. And we certainly don't need them constructed in separate areas to double the environmental damage.

The FERC approval process was widely considered a rubber stamp. The fact that it approved the Atlantic Coast Pipeline when there was an incomplete environmental statement means that certainly was not an impediment in the NEPA process. The fact that FERC approved the pipeline without a final EIS for another reinforces how flawed the process is.

So, if anything, it seems that FERC has been a disaster, which is both sides of the political aisle. Both Republican and Democratic Members of Congress agree. So, we should be very careful before we argue that we should gut NEPA and the ability for local communities to weigh in.

Ms. Gentle, first of all, I do think Paris is a geopolitical issue of great importance. How do you square LNG exports with the commitment of countries to reduce their greenhouse emissions under the Paris Agreement?

Ms. GENTLE. Thank you very much for the question.

As a hiker on the Appalachian Trail in Virginia, I am sympathetic to your concerns. And I think that natural gas actually has a tremendous opportunity to support international goals for decarbonization and also for increased use of renewables in the overall power generation mix.

I would cite to the example of the Iberian Peninsula just this last year as a perfect example of the partnership between natural gas and renewable energy, where the Iberian Peninsula depends a lot on hydroelectric and wind power for their renewable power generation. They had a lack of wind and a lack of rain this past year, and there was a 50-percent increase, therefore, in natural gas imports. Thankfully, they have the back-up gas-fired power generation that enabled them to have reliability in their grid. And Portugal now is, I think, the largest importer in Europe of U.S. LNG.

Mr. BEYER. Thank you.

Countries in the Caribbean are dependent on Venezuela's PetroCaribe program for fiscal support. Can the U.S. LNG exports be of help to these small countries?

Ms. GENTLE. Absolutely. We believe that there are systems that can be developed for distributed LNG, somewhat like a hub-and-spoke. So, a large LNG vessel could depart from the United States carrying LNG and then off-load to a hub in the Caribbean onto smaller vessels and then bring LNG to the Caribbean and displace oil-fired power generation, significantly cutting the cost of power for our very important neighbors and allies.

Mr. BEYER. Won't more LNG exports mean more methane leakage at home?

Ms. GENTLE. We certainly are very focused on this issue. It is important for the industry to work together also with government and regulators to ensure that we absolutely minimize, if not eliminate, methane emissions and especially leakage.

Newer infrastructure is, of course, much more secure in terms of leakage, so we are turning our attention to producing gas in the United States and ensuring that through older infrastructure we can reduce the leakage.

Mr. BEYER. It has been argued that we need LNG in order to keep energy prices low in the United States. If we are exporting it, though, won't that drive up domestic prices?

Ms. GENTLE. There actually are numerous studies that have been done over the past 5 years or so by the EIA, who have commissioned independent studies on this very issue. We agree it is an important concern. And the findings have been that we have such a vast reserve base in the United States that can be produced at very economic cost, that the impact of exports will be very minimal to the domestic prices.

As an example, we have seen over the last several years that increased improvements in drilling technology have actually reduced the cost of production. We are now below \$1 in MMBTU of production cost in the field in many of our major basins, which, for the first time ever, actually makes us competitive on a global basis with all suppliers around the world.

Mr. BEYER. Thank you.

Mr. Chair, I yield back.

Dr. GOSAR. I thank the gentleman.

The gentleman, the Chairman for the Full Committee, Mr. Bishop from Utah, is recognized.

Mr. BISHOP. Thank you, Mr. Chairman.

I appreciate the witnesses, especially this topic area that we have.

The past two decades in the United States have truly been revolutionary. There was a time when manufacturing was leaving this coast because of excessive cost for energy as well as lack of security and what the future will be. That has all changed now. We have revolutionized how we develop our domestic product; we are maximizing that, not only here but abroad.

I am interested in a lot of discussions—maybe Mr. Lamborn's question. Boston, it was shipped in there because there was a pipeline stranglehold in Pennsylvania and New York. You can't get it there. So, if you are not going to be able to do it by pipeline, you have to build some LNG ports. And that is really the problem that we have.

It is ironic, because we just came back from a CODEL in Australia, and I found out that Australia is probably going to be the leading LNG exporter by 2019. At the same time, I also found out that western Australia, where all the produce of the stuff is, has the same attitude toward eastern Australia, where the population is, as I from the western United States have toward eastern—nothing personal—United States. In fact, they call them the wise men of the East, with as much derision as I would as well.

But, ironically, even though they have the resources there, in the East, they are still having brownouts. And they are still exporting LNG and then trying to legislatively keep it there to try to solve that problem. And the problem comes from the stuff that we are looking at as well.

There are no pipelines that go east and west in Australia. They all go north and south. To build one across the desert would be terribly expensive. But to have LNG ports in Sydney and Melbourne so that you could move it by transporting that way would be very easy to do.

The other problem is, in the East, that is where they have their coal, and they have banned their coal-fired stuff for whatever political reason they wanted to, which has caused them to have—even though they have all sorts of exports and potential and development, they are still coming up with policies that give them rolling blackouts and brownouts in the process.

But that is the same thing that we could be looking at in the United States. Not only are we talking about the ways of helping our allies in Europe, especially the Baltic states, but also a lot of this LNG is going up to China, Korea, and Japan. Working with our allies, we could become a part of Pacific stability so that we could be a counterforce to some countries in the Pacific that are not necessarily that positive toward us right now, as well as providing for our own country at the same time.

So, Mr. Smith, let me get to you. We talked a lot to them about permitting processes. Are there some things we can learn about the permitting process in Australia and maybe in Canada—because they always look at Canada as having a better permitting

process—that we could learn to make it easier for us to try to use the resources to solve these geopolitical problems at the same time?

Mr. SMITH. Thank you, Congressman, for the question. Lots of issues there at the end of the statement that you just made around some of the challenges on the East Coast and in Australia and also issues that we have to deal with as an LNG exporter in the Gulf Coast.

First of all, we spoke a moment ago about the permitting process. In all cases, we always like these things to roll along a little bit more quickly. We are in a hurry to build what we can, to deploy the capital that we have raised to construct our terminals. But, overall, we think having a transparent, rigorous process in the United States has been part of our competitive advantage.

When we go to India, when we go to China, when we go to other countries and we are selling these long-term agreements, we do so with a confidence that the regulatory process that we have to go through here withstands the legal scrutiny that it is put under.

Mr. BISHOP. Like, the transparency is obvious, and it is good. What we are talking about also is the length of time that it takes before a company can start the process to when they can be in production and making it.

And the point of this is trying to be, we have this LNG that is very positive here that can make us a true source of strength to our allies, both in Europe and in the Pacific, where we have countries that are not friendly to the United States that are actually trying to push their will upon us.

That is one of the things we are looking at in an energy bill that we will be bringing to the Floor, trying to partner with our states to streamline the permitting process—not change the rules, but allow the paperwork to be done in a way that we can actually be up and in production to actually assist.

And one thing I found out in our trip to Europe, as well as this recent trip to Australia, is the United States can play a huge role in working with our allies to stabilize, geopolitically, this world if we are smart on how we actually do it. And that is one of the reasons why we have to have more pipelines and right-of-ways. We also have to have more LNG ports. And we have to be able to do it faster, quicker. Not taking away the transparency and accountability, just the time it takes to do what is blindingly obvious.

I am sorry. I went over 40 seconds. I apologize. I will give you an extra 40 seconds on our next markup. Is that OK? And I will take it from Lowenthal's time.

Mr. LOWENTHAL. I can probably get it spoken in less than 4 minutes.

Dr. GOSAR. The gentleman from Florida, Mr. Soto, is recognized for 5 minutes.

Mr. SOTO. Thank you, Mr. Chairman.

On November 7, 2017, last year, Syria, despite being embroiled in a civil war, managed to become yet another country that joined the Paris climate agreement, leaving us with the infamous distinction of being the only country on the entire planet that is not part of the Paris climate agreement now.

Having looked up some of the trends with liquefied natural gas, Mr. Doran, it seems that the Paris Agreement has actually

increased demand for liquefied natural gas in Europe. Is that fair to say?

Mr. DORAN. I would argue, respectfully, that the market is driving a great deal of demand, plus increased European regulations that shift the fuel mix in Europe to a more diversified mix, including natural gas.

Mr. SOTO. Well, thank you for that. And, certainly, we have some other analysts who have said that, because the liquefied natural gas actually reduces emissions, it is helping both the United States and our European allies reduce their emissions so that they could actually comply with the Paris climate agreement.

Ms. Gentle, Mr. Smith, do you all support the Paris climate agreement because it increases the demand for liquefied natural gas from the United States?

We will start with you, Mr. Smith.

Mr. SMITH. Thank you for the question.

Cheniere is on the record as supporting the United States' participation in the Paris climate agreement. We actually sent a letter encouraging the United States to remain in the agreement.

Subsequent to the decisions that the Administration has made, which we understand, it really does not impact the reality of our commercial situation. We are selling in a global market. Every single customer to whom we sell resides in a country that is part of the Paris Accord. And those countries see that the product that Cheniere sells is the one that helps them reduce emissions, increase reliability, et cetera.

Mr. SOTO. Has the Paris climate agreement helped you increase sales for your company?

Mr. SMITH. What I would say is that the global driver to reduce emissions and increase diversity of supply, and to take into account these environmental issues, has been a net benefit for Cheniere.

Mr. SOTO. Ms. Gentle, has your company seen an increase in demand because of that?

Ms. GENTLE. I would say that the commitment that various countries have made to the Paris Agreement to reduce emissions and have a balanced electric generating profile has generally increased demand for natural gas because—

Mr. SOTO. Thank you for that. I have limited time, but I appreciate that comment.

Turning next to Mr. Livingston, how critical are the wind and solar tax credits to continuing to encourage renewable energy production in the United States?

Mr. LIVINGSTON. I can say that in recent years they have been incredibly important in allowing this industry to gain its footing and to help provide additional support where the full external costs of other energy resources are not internalized via carbon price. So, it is another method to try to level the playing field.

These technologies, wind and solar, are increasingly maturing. I don't know exactly what point in time, but within a few years they will no longer need that credit for their survival to the same degree they did in the past. However, it remains an important, and it has been a very important policy instrument for supporting those technologies.

Mr. SOTO. A lot of us have had mixed feelings about the tariffs on solar-powered panels coming in from China. Is this a plus or is this a minus for the industry domestically? What is your opinion on that?

Mr. LIVINGSTON. Yes, sir. Thank you for that question. It is a good one.

I think that addressing China's dumping of solar modules and panels in the United States would have been best addressed a number of years ago. At this point, it is too late. So, I think that the effect of the tariffs is likely to be more pernicious than not.

Just a few notes.

Number one, I believe the duration, including the step-down over the number of years that the tariffs will be in place, does not give enough time for U.S. manufacturing to make actual investment decisions. The step-down occurs in such a way that the benefits would be accrued mostly in 1 year or 2 years, and then for all the out-years you would still have them be out-competed by Southeast Asia, East Asia, et cetera.

Number two, solar manufacturing is becoming increasingly automated and advanced. That is not necessarily a negative thing, but it is a reality of the market. In fact, First Solar has a plant in Toledo, Ohio, that had to close due to Chinese dumping, reopened, highly automated, and now produces solar panels which can compete with Chinese panels that are in fact 30 percent cheaper. So, to the degree—

Mr. SOTO. My time is up, so thank you for that.

I yield back.

Dr. GOSAR. I thank the gentleman.

The gentleman from Colorado, Mr. Tipton, is recognized for 5 minutes.

Mr. TIPTON. Thank you, Mr. Chairman, and thank the panel for taking the time to be here.

It is interesting, listening to some of the dialogue that we are having right now, in terms of the benefits of responsibly developing a resource and to be able to develop LNG for export.

I did want to address, Mr. Smith, your comments that you don't actually deal in the production. You just facilitate actually being able to sell it. You rely on the pipelines and other producers to be able to get it through.

I just read a report on CNBC that Shell Oil had just made the comment that the market for LNG could face a shortage by the mid-2020s due to underinvestment in new projects.

How important is it for us, as a country, to be able to maintain the edge, not only for our own energy security, our own jobs, keeping those prices low for American consumers, but also being able to address something Mr. Doran had mentioned, being able to compete on the world stage as well, given that we had Mr. Putin with his hand on the valve for a lot of Europe?

Mr. SMITH. Thank you for the question, Congressman.

We absolutely believe that LNG is tremendously important in that area. We see that there are players in the market, like Cheniere, that are having success and selling into various markets. There are other projects that I think have the potential to come on line. And we see an increasing amount of LNG coming out of the

United States, which is not only really beneficial for our country in terms of job creation, but also provides opportunities and options for our allies and our trading partners around the world.

So, those U.S. molecules being able to project American influence through exporting of hydrocarbons developed right here in the United States we see as being very positive, not only for our economy but also for the global economy and, again, for our allies and trading partners who buy LNG from the United States.

Mr. TIPTON. Great.

Would you concur with what Shell was just noting, that if we don't have the continued investment, the continued development in terms of being able to build the export facilities out, to be able to address that, with some of the suppressed prices that are out, that we may actually have an actual shortage? That it is important to keep those investments going?

Mr. SMITH. I think it is very important to ensure that we can move capital to these projects, that new projects do get built.

Cheniere does see a next wave of LNG projects being constructed. We are expecting to get a final investment decision on our third train in the Corpus Christi facility in Texas, which will be the first new production, new final investment decision made in the United States since 2015.

We see other projects coming forward. So, we absolutely feel that that is a real opportunity to build capital right here in the United States, and we think that is really important.

Mr. TIPTON. Great.

In my part of the world, the West Slope of Colorado, in the Piceance Basin, with the Mancos Shale, we have the USGS coming out and saying it could be the second-largest reserve that we have in the country.

And, Ms. Gentle, you are nodding your head. I know you are well aware of, probably, that particular area.

How important is it for us to be able to have those pipelines to be able to deliver it? You made the comment you want to be able to go where you are welcomed. I think everybody will welcome having heat on in the winter, cooling on in the summer, no matter where you are—to be able to actually deliver that and have that sustainable, affordable supply.

Ms. GENTLE. We concur it is absolutely critical. And, overall, we believe that over \$170 billion of investment is needed in pipeline and export infrastructure in the country, which was originally piped to deliver gas from the Gulf Coast to the major cities on the East Coast, West Coast, and Chicago market area. Now that supply is coming from west Texas, Rockies, Northeast, all of the pipeline systems have to be rerouted and new pipelines have to be built.

Mr. TIPTON. Great.

Mr. Chairman, I think it is remarkable, if we step back in time, not long ago they were saying that we were going to run out of energy in this country, we were going to have to be importing LNG into the United States, and now we are in a position to where this country can lead. We can put our people to work. We can address a lot of the complications that we see in terms of the geopolitical issues they are facing over in Europe and elsewhere with American

ingenuity, American inventiveness, to be able to create this abundant, affordable supply of energy, to be able to keep the lights on, and to be able to keep our people employed.

Thank you for holding this hearing, and thank our panel for taking the time to be here.

Dr. GOSAR. I thank the gentleman.

The gentleman from California, Mr. Costa, is recognized for 5 minutes.

Mr. COSTA. I want to thank the Chair and the Ranking Member of this Subcommittee for holding a hearing which I think is very timely, given what is occurring not only in Europe but around the world. The geopolitics of natural gas and gas exports, obviously, are critical in terms of our relationships.

As a Democratic co-chair of the Transatlantic Legislators' Dialogue, I work closely with our European allies. We meet twice a year on multilateral relations that can strengthen our democracies in Europe and our influence as it relates to freedom around the globe.

I think this Administration has had positive and negative effects on our European allies, and I think many of them are very obvious. One of the positive effects is that this Administration has had a continuation of policies that led to the development of America's unconventional oil and gas resources that were really begun in the last administration, the Obama administration. I have said for 14 years on this Committee that I support using all the energy tools in our energy toolbox, and I think I have been consistent.

The development of these resources have had a remarkable impact on the global landscape on energy. Only last year, as we all have acknowledged, the United States became a net exporter. It is commendable it provides opportunities not only for the United States to improve the security of our allies and the globe by weakening the influence of bad actors like Russia, but it also provides an opportunity to wean these countries off, as we have all agreed upon—I think there is a sense of agreement here in the Committee—kind of unusual—that we wean these countries off of other energy sources that, obviously, don't have the same common agreement in human rights and other values that we all, as a democracy, support.

Energy sources that emit a larger percentage of greenhouse gases, of course, contribute to climate change. We know that. This is one of the areas where, generally, European leaders wish we would rejoin the Paris climate agreement and disagree with the current action of this Administration.

But I can tell you, from our regular dialogue, that development of natural gas resources sends a strong message around the world in favor of open, non-politicized global energy markets. This is already having an important effect on behaviors and policies, as all of us have generally acknowledged. Europe is actively working to diversify its external suppliers and become increasingly dependent on imports of oil and gas.

The EU is working to develop infrastructure, as was noted by the Chairman, that will permit energy to flow around Europe continental-wide. And that is important. It is in this area that the European gas diversification and the United States may play the

biggest geopolitical role. The existing licensing of the regime for U.S. LNG exports to the EU is a restriction that should not exist, I believe, with close allies like the EU and the United States.

There is a proposal in the framework of the Energy and Natural Gas Act of 2017 that has been submitted to Congress to restrict the amount of time that the Department of Energy has for assessing non-free-trade agreements in LNG export applications to 45 days. I think that is important.

While this would be a good step, the complete removal of the requirement of the Department of Energy to approve LNG exports to the EU, I think, would bring significant economic and employment benefits to the United States, enhance the energy security for Europe, and it would build better relationships that I think have suffered in the last year.

It makes no sense for multiple Federal agencies to be involved in processing permits to export gas to countries which we already have free trade agreements with. These are the type of common-sense policy changes that could not only improve our economy but our national security as it relates to our allies in Europe.

Let me ask some questions.

Mr. Smith, are there some beneficial aspects to removing the requirement of the Department of Energy approval of the export LNG to countries which already have free trade agreements with the United States?

Mr. SMITH. Thank you for the question, Congressman.

One thing I would note is that these are major investments. Cheniere has invested over \$30 billion in our facilities. Generally, in order to underpin those investments, one would need to be able to send liquefied natural gas both to FTA countries and non-FTA countries.

Mr. COSTA. Are there drawbacks to removing the requirements?

Mr. SMITH. Are there drawbacks? There are probably not any drawbacks. I am not sure that there are any benefits either.

Mr. COSTA. The benefits certainly outweigh whatever drawbacks there may be.

Do any of you want to comment on this?

Mr. DORAN. Mr. Congressman, if I can just jump in really quick, I would say that you are exactly correct. Atlanticism means increasing the ties that bind with our allies. Cutting red tape in the export of American hydrocarbon resources to our allies is a good thing for us and it is a great thing for countries that we are treaty-bound together with. That is the nature of Atlanticism, and that should be, in my view, a priority for this Congress.

Mr. COSTA. And weaning them off of Russia, which obviously does not have any interest in supporting these democracies, as we know.

Mr. DORAN. I would heartily concur.

Mr. COSTA. Thank you.

Dr. GOSAR. I thank the gentleman.

The gentleman from Georgia, the dog himself, Mr. Hice, is recognized.

Mr. HICE. Thank you, Mr. Chairman.

I am intrigued with our discussion and the line of questioning Mr. Costa was going down. Right now in Georgia, the first next-

generation liquefaction plant is under construction at Elba Island. It should be beginning production by the middle of this year and in full production by the end of the year.

And they have actually obtained authorization from the Department of Energy for our free-trade-agreement countries, to export to those countries. They will be producing 2.5 million metric tons a year. Obviously, that is a huge economic issue for Georgia, and for our country and beyond.

I am not sure exactly who all to address my questions, but, Mr. Smith, I will begin with you. Considering the current rate of production of natural gas and the capacities of Elba Island, the production plant there, do we have enough plants in America to keep up with the production needs?

Ms. GENTLE. We do not have enough plants to keep up with the production.

The EIA is estimating that we will have a 25 percent increase in natural gas production in this country by 2025. That is an additional 20 Bcf a day of production over and above the 80 Bcf a day almost that is produced today. And there are roughly 8, including Elba Island, 8 Bcf a day of export infrastructure that is under construction today. We still need 12 to 13 Bcf a day of additional demand, and most of that will need to be export.

Mr. HICE. So, are you saying we would need an additional 12 plants? How many more plants would be needed so we keep up with the production needs?

Ms. GENTLE. If they were Elba Island-sized plants, we would need six. If they were Tellurian-sized plants, we would need three.

Mr. HICE. OK.

What, if anything, needs to be done here in the House of Representatives or, even more specifically, in this Committee to help speed the process up, to get production up to where it needs to be?

Ms. GENTLE. So, incidentally, we are a producer of natural gas. We produce gas in the Haynesville, which is in north Louisiana. And we are really asking legislators to do one primary thing, and that is to continue to support the streamlined and efficient regulatory process.

By way of example, when I did work for Cheniere, we permitted the Sabine Pass export terminal in 12 months, and it will take us about double that time to permit the Driftwood LNG facility. So, you can see that, even from the very first plant to today, we have had a considerable increase in the time that it takes to complete the process even though we have the exact same people working with the local, state, and Federal officials.

So, it will be beneficial for us, anything that can help streamline the process. Make sure FERC has the appropriate resources to be able to work through the permits that they have in front of them and stick to the timelines that are already part of the policy that don't allow extra tolling procedures to add 30, 60, 90 days to comment periods.

Mr. HICE. Very good. All right.

And, again, I am not sure who would be best to answer this last question, because my time is running out. I think, Mr. Smith, I want to go to you, but anyone else can chime in.

As our export capacity grows, we will increasingly, obviously, be able to compete with other countries, like Russia, and the impact that that will have in Europe, I think, is significant.

Do you feel that our ability to export LNG to Europe would reduce the leverage of Russia in the region and improve the national security of those countries?

Mr. SMITH. Thank you, Congressman.

I think the answer to that is definitely yes. The fact—

Mr. HICE. Real quickly, before you go further, let me just get everybody else. Just go down the line.

Mr. DORAN. Yes, if we can increase the interconnectivity of countries in Europe so that the natural gas not only goes to an LNG receiving facility on the water but then it can move across borders to other allies that are landlocked and more distant from maritime facilities.

Mr. HICE. Well, that is what I am getting to. But would it help the national security?

Mr. DORAN. Yes, it would.

Mr. HICE. OK.

Mr. LIVINGSTON. I fully agree. Yes, it would. And, I think, it is a positive contributor to Europe's own energy union strategy, as Peter mentioned.

Ms. GENTLE. I fully agree as well.

Mr. HICE. OK. Great.

I am sorry, my time is up, Mr. Smith. If you have more comments, please submit that. We would appreciate it.

Thank you.

Dr. GOSAR. I thank the gentleman.

The gentlewoman from Wyoming, Ms. Cheney, is recognized for 5 minutes.

Ms. CHENEY. Thank you very much, Mr. Chairman.

And thank you to all of our witnesses for being here.

Mr. Doran, I wanted to start with you. Could you talk a little bit more about—you mentioned in your written testimony the fact that Secretary Tillerson has been clear about our opposition to the NS2 pipeline. Talk about what you see as the next steps, what are the next actions we need to take in terms of opposing that pipeline, making clear that we view it as fundamentally inconsistent with our interests.

Mr. DORAN. Thank you, Congresswoman. I will be brief and direct. I will sum it up in three points.

The first one is that, for years, Europeans have been asking the United States to lead from the front. So, when Secretary Tillerson was in Warsaw declaring America's opposition to Nord Stream 2, something that is against our interests, against the interest of allies, America was demonstrating the kind of leadership that we have been looking to see. That is good.

Now we need to align the rhetoric with actual actions that can truly support allies and help achieve what America has wanted, and that is to increase a market environment where energy is not politicized, it is a commodity like anything else. That should be the goal.

How do we do this? First of all, we need to recognize that Russia is not competing on a fair playing field. Russia provides subsidies

that industry in America cannot match one-to-one, so we actually have to use existing rules and regulations to our advantage.

As a citizen, I would propose to this Committee that the Countering America's Adversaries Through Sanctions Act of 2017, and especially section 257 that directs the State Department to increase its outreach to Ukraine to increase their energy security and promote their reform process, are essential parts of the fight against Nord Stream 2.

Ms. CHENEY. Thank you.

And then you also mentioned in your response to Mr. Hice the importance of infrastructure in Europe and interconnectivity in Europe. As we look at what options are available to us in the United States to help counter the weaponization of energy that the Russians have clearly undertaken, what are the specific things that you see that the Europeans need to do? How can we help to encourage that kind of activity and that kind of interconnectivity?

Mr. Smith?

Mr. SMITH. We don't have a particular position on Nord Stream, on the pipeline itself. We do believe that the U.S. LNG industry is providing a product to Europe that is valuable for our customers there on the continent, particularly with our allies and trading partners.

We are seeing that markets are driving U.S. LNG into the European market in a way that is providing new flexibility and diversity to those customers. So, even if molecules are not going from the United States to Europe, just the fact that that is an option, just the fact that those are available to those customers, we think, is providing a valuable service.

Ms. CHENEY. Have you seen action on the part of countries—this is for either Mr. Smith or Mr. Doran. I think in your testimony, Mr. Doran, you called them, obviously, the landlocked countries—but actions to indicate their willingness to take the kinds of steps that would be needed in order to either wean themselves from or prevent them becoming dependent upon Russian sources of energy?

Mr. DORAN. I would say this: the answer is yes, and the key right now has been a lack of options. For the very first time in years, we are beginning to see those options emerge. The process is not done. Interconnectivity is beginning to happen, but the job is not done.

If we can find ways to increase cross-border, multidirectional interconnectors across countries in Europe and across borders, that is a crucial next step in the development of a market-based energy and especially gas market in Europe.

I would encourage the Administration and, to the extent it is appropriate, for Congress to encourage the Administration to show strong American leadership.

Also, in the case of Croatia, we would like to see, as an American, new LNG receiving facilities in the Adriatic as well as in Poland's Swinoujscie and Lithuania's Klaipeda facilities.

Ms. CHENEY. Thank you very much.

I will yield back the balance of my time. Thank you, Mr. Chairman.

Dr. GOSAR. I thank the gentlewoman.

We are going to go a lightning round. The Ranking Member always has to put up with me, so we recognize the Ranking Member for his questions.

Mr. LOWENTHAL. First, I want to thank the Chair for acknowledging that I have to put up with him. But that is a whole other issue, and that would take a lot longer than my 5 minutes. But I do appreciate working with the Chair. Obviously, it was said in jest.

This question is really going to be for Mr. Smith and Ms. Gentle. Between 2009 and 2015, oil and gas producers on public and Indian lands flared, vented, and leaked over 460 billion cubic feet of natural gas. According to the Government Accountability Office, taxpayers are losing as much as \$23 million a year in lost royalty revenues from this wasted energy resource.

As you are aware, the Obama administration developed regulations requiring industry to reduce natural gas venting, flaring, and leaking at operations on public lands. The Trump administration is trying to undo this rule even after Congress specifically voted to keep it.

My first question to Mr. Smith is, does Cheniere support the 2016 Bureau of Land Management Methane and Waste Prevention Rule? And what are some of the economic and environmental benefits of decreasing natural gas flares and leaks?

Mr. SMITH. Thank you, Congressman, for the question.

Cheniere is the largest purchaser of natural gas in the United States. We purchase from nine states throughout the United States. We are on the record already as supporting the BLM rule.

I would note that the majority of the gas we purchase, or that is produced in the United States, is produced on public lands, so one could discuss the overall impact of that rule.

But, overall, as we endeavor to work with suppliers to reduce methane emissions, one thing you note is that, if you are concerned about energy security, you are concerned about economic development, you are concerned about climate or methane or greenhouse gas emissions, this is great low-hanging fruit. Because this is the one area in which you can reduce emissions and you can actually sell the stuff that you are reducing.

So, we think that there are a lot of actions that producers can take to make headway in this area, and we look forward to working with our suppliers to make that happen.

Mr. LOWENTHAL. Thank you.

Ms. Gentle, as President and CEO of Tellurian, do you support the 2016 Bureau of Land Management Methane and Waste Prevention Rule? And what are the economic and environmental benefits of decreasing natural gas flares and leaks?

Ms. GENTLE. Yes, we support minimizing flares.

Mr. LOWENTHAL. Do you support the rule?

Ms. GENTLE. We support the rule, and we support minimizing and preventing flares, leaks, and venting on public and private land all across the industry.

And there is an enormous environmental benefit. As Mr. Smith said, not only are you able to reduce the emissions, you are also able to sell the gas. And then the gas can displace other fuels that have higher emissions than natural gas when used, for example, in

power generation, where natural gas has 50 percent or more of the reduction in carbon emissions compared to even the cleanest coal-fired power plant in service today.

Mr. LOWENTHAL. Thank you.

Thank you, Mr. Chair. I yield back.

Dr. GOSAR. OK.

All four of you listened very carefully. What was the question you wished was asked, and what is the answer?

We are going to start with Mr. Smith first.

Mr. SMITH. Well, thanks for the question. That is a tough one because you actually asked pretty good questions. I think we had an opportunity to talk about the things that were important to us.

Perhaps the question that I would raise would be what do we think the prospects are for a company like Cheniere going forward in terms of creating economic value.

We pointed to some of the successes that we have had in terms of long-term commercial agreements into Europe, into India, into China. We believe that there is more of that to do. And we have appreciated the support that we have gotten particularly from the Department of Commerce and particularly in making inroads into China.

The China deal is really an opportunity to help balance of trade, to project American influence abroad by taking hydrocarbons developed right here in the United States and selling those into China. So, we appreciate that support and hope that it would continue in the future.

Dr. GOSAR. Mr. Doran?

Mr. DORAN. Thank you, Mr. Chairman. That is probably one of the best questions I can imagine.

I would say this: what happens when we win? If we were in a competition geopolitically and in a market competition with other suppliers of energy to Europe, what happens when America succeeds and we win?

And I think the answer to that question would be: we will find increased opportunity for American jobs at home. We will find better relationships with allies who are looking for signs of long-term American commitment to their security. Energy security, as you have identified, is a national security priority.

So, when we win, we will see a variety of economic as well as strategic benefits to American interests in Europe.

Dr. GOSAR. Mr. Livingston?

Mr. LIVINGSTON. Terrific.

I would like to build off of Mr. Doran's question and ask myself: what can be done to ensure and invest in American dominance or winning the next battles that lie in energy markets globally? The answer to that would be to build on America's superlative strength, the key source of America's energy edge, which is innovation.

So, what I would recommend, to the degree that it is within Congress' ability to do so, is to support some of the vessels and some of the agencies and initiatives that have supported that energy innovation over time.

Whether it be ARPA-E, whether it be initiatives like the SunShot Initiative, the United States has a rich history of creating the technologies that end up defining energy ethics across the world, be it

nuclear energy, shale drilling technologies, the modern solar PV industry, et cetera.

And I would urge and encourage the United States and Congress to continue to invest in capabilities that will guarantee a prominent U.S. role in those energy technologies for years to come.

Dr. GOSAR. Ms. Gentle?

Ms. GENTLE. Thank you, Mr. Chairman.

As you all have noted, for the first time we are now a net exporter of energy, not only of natural gas but also oil. And this gives the United States an unprecedented opportunity to fundamentally change the global energy balance of power and bring energy security to our allies.

One thing we did not talk about, I guess the question we did not ask is: what happens if we don't continue to support exports? And the answer to that is that we will hurt the industry that we have worked over the last decade to build up in this country and attain our own energy independence.

If we don't allow the continued growth of markets, including domestic and export markets, we will not be able to sustain the investment in upstream drilling both for oil and natural gas.

And, as we continue to see, especially in the Permian, the comingling of gas associated with oil production, we need to find markets to that gas in order to continue producing oil, or we will have increased venting or shut-ins of production.

So, the support of the export market is really at the same time supporting our own domestic industry.

Dr. GOSAR. Those are actually great questions.

The only comment I have, Mr. Livingston, is in IP, intellectual property. That is kind of problematic now that we are no longer the leader in the world. China has taken that purview, and it has been noted all the way around the world.

But I have to compliment you. Great questions. Maybe we ought to put you guys up on the dais.

I thank the witnesses for their valuable testimony and the Members for their questions.

Members of the Committee may have some additional questions for the witnesses, and we will ask you to respond to those in writing.

Under Committee Rule 3(o), members of the Committee must submit witness questions within 3 business days following the hearing by 5:00 p.m., and the hearing record will be held open for 10 business days for those responses.

If there is no further business, without objection, the Subcommittee stands adjourned.

[Whereupon, at 3:50 p.m., the Subcommittee was adjourned.]

[LIST OF DOCUMENTS SUBMITTED FOR THE RECORD RETAINED IN THE
COMMITTEE'S OFFICIAL FILES]

Rep. Gosar Submissions

- BLUEPRINT 2025—Comments on Oversight Hearing, detailing concerns on the analytics and communications technologies of the 1970s and 1980s dictating our environmental review procedures of the 21st century.
- BLUEPRINT 2025—Statement for the record from November 29, 2017 Oversight Hearing, regarding support for NEPA modernization and of insights into the lengthy permitting processes.

